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AN ANALYSIS OF A
ZERO-BASE BUDGETING
SYSTEM IMPLEMENTATION AT A
U. S. NAVAL ACTIVITY

Gale Eugene Heavilin

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NAVAL POSTGRADUATE SCHOOL

Monterey, California



THESIS

AN ANALYSIS OF A
ZERO-BASE BUDGETING
SYSTEM IMPLEMENTATION AT A
U.S. NAVAL ACTIVITY

by

Gale Eugene Heavilin

December 1977

Thesis Advisor:

J. C. Robertson

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An Analysis of a Zero-Base Budgeting
System Implementation at a U.S. Naval Activity

by

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Major, United States Marine Corps
B.A., Central Missouri State College, 1966

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the
NAVAL POSTGRADUATE SCHOOL
December 1977

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ABSTRACT

This study evolved from a series of zero-base budgeting seminars given by Naval Postgraduate School at Naval Weapons Center, China Lake during the summer of 1977. Using a survey questionnaire as a data base, the analysis compares the actual problems of implementation with the theoretical problems of implementation. The study includes a brief outline of zero-base budgeting theory and a detailed outline of the theoretical problems of implementation. The study concluded that the problems encountered by China Lake had already been adequately described in theory and that the dominant problem categories experienced were those of Administrative, Planning Assumption, Top Management, Time, and Behavioral. The study also concluded that initial efforts of top management to use the cost-cutting feature of zero-base budgeting, which predisposed a significant portion of the management and staff population against the system, affected negatively its later, full-scale implementation.



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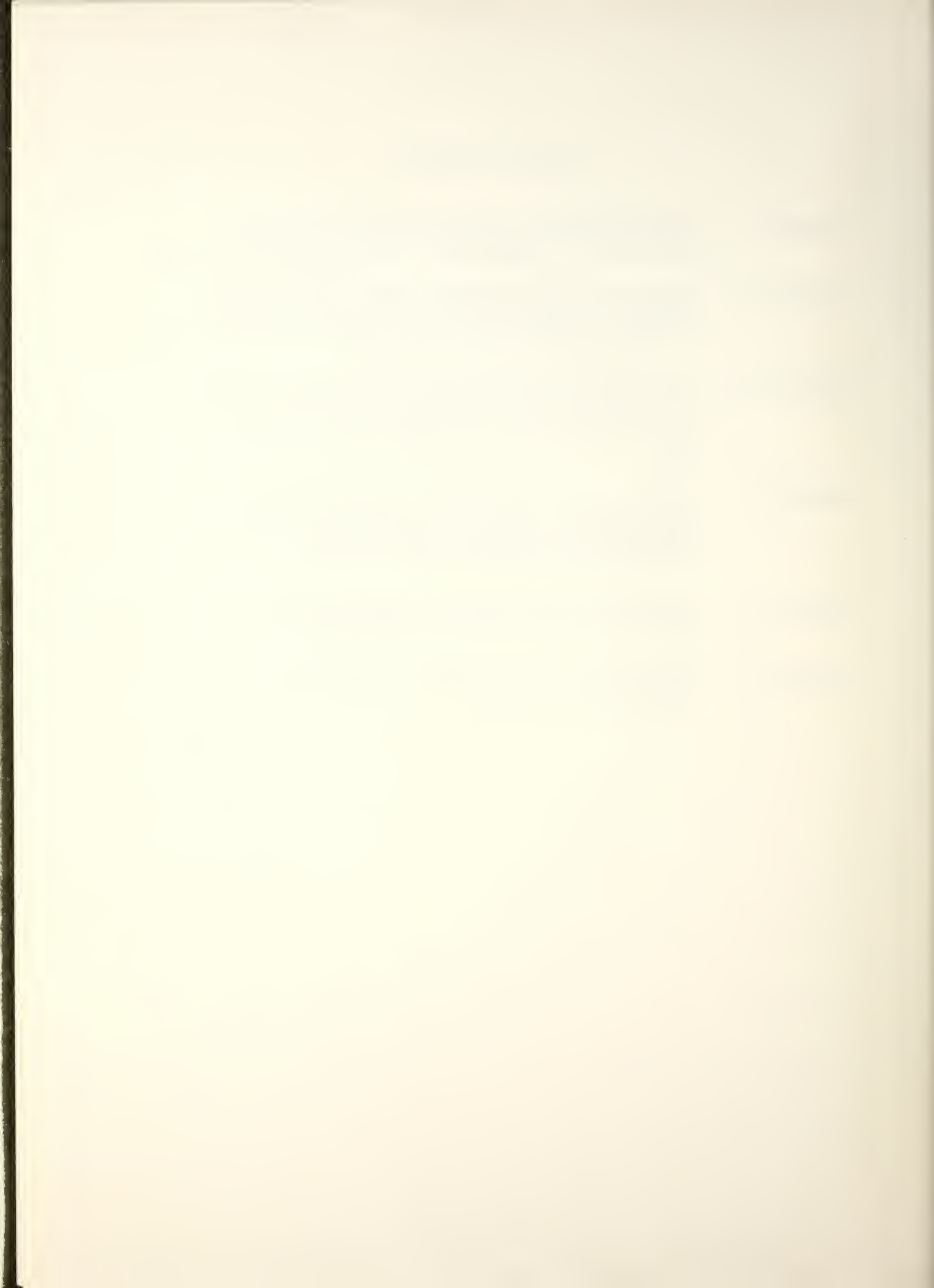


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I. INTRODUCTION

A. BACKGROUND

This study evolved out of a series of zero-base budgeting seminars given by the Naval Postgraduate School Administrative Science Department at Naval Weapons Center, China Lake during the spring and summer of 1977.

The seminars resulted from efforts to implement zero-base budgeting at Naval Weapons Center under the direction of Rear Admiral R. G. Freeman. The implementation began at a time when relatively little information about the subject was generally available and the decision to install the system and the efforts by everyone at the Center to support it were made under conditions of great uncertainty and thus were considered to be forward-looking and innovative actions. Naval Weapons Center requested that Naval Postgraduate School provide training assistance for key personnel from department staffs and selected line managers.

The loosely structured seminars were designed to highlight the essential concepts of the zero-base budgeting process. The chief characteristic of the seminars was their interactive nature. A case exercise in zero-base budgeting development was designed to give trainees a "hands on" encounter with the basic elements of zero-base budgeting.



From the interactive seminar discussion came two significant observations by the Naval Postgraduate School faculty members involved. First, there was a great deal of curiosity and interest concerning zero-base budgeting processes among the trainees. Second, among the trainees there was a significant amount of discontent with regard to the implementation efforts then extant at Naval Weapons Center.

A third observation, made by the author, that Naval Weapons Center offered an example of zero-base budgeting implementation at a micro-level organization, combined with the two observations above, provided a convenient opportunity for comparison of zero-base budgeting theory and actual implementation experience.

B. SCOPE

The purpose of this study was to compare actual implementation results with theoretical writings. Since unexpected results might have been due to factors not covered by theoretical literature, the possibility of inadequate theory was also considered in the conduct of the study. However, the likelihood and importance of this event occurring was regarded as relatively insignificant.

The problems of implementation were used as a basis for the investigation. Consequently, two core premises formed the foundation for the study. First, correct implementation of zero-base budgeting, with respect to theoretical writings, would lead to expected satisfactory results. Second, incorrect implementation would lead to expected



problems. Based on a general inquiry as to the nature of the zero-base budgeting implementation effort at Naval Weapons Center, a comparison was made between the actual problems encountered and those predicted in theory.

In conducting this study of the Naval Weapons Center implementation experience, an inductive approach was used and general conclusions were drawn from analysis of specific data.

C. RELATIONSHIP TO PREVIOUS WORK

The first major publication on zero-base budgeting was written by Peter A. Pyhrr, then of Texas Instruments where the concept was developed from 1968 to 1971. His article, "Zero-Base Budgeting," in the November/December 1970 issue of the Harvard Business Review stirred considerable interest. The newly elected governor of Georgia, Jimmy Carter, invited Mr. Pyhrr to join his staff and install the system there for the fiscal year 1972-1973. In 1973 Mr. Pyhrr's book, Zero-Base Budgeting, was published. The reader is referred to this seminal work for further inquiry.

The Georgia zero-base budgeting experience was the subject of a study conducted by George S. Minmier, a doctoral candidate at the University of Arkansas. His study, An Evaluation of Zero-Base Budgeting as a Tool for Planning and Control of Discretionary Costs in Governmental Institutions, published in 1974, concluded that there were three



primary advantages, one major disadvantage and two significant shortcomings associated with the employment of zero-base budgeting in the state of Georgia. The first advantage was the establishment of a financial planning phase prior to the preparation of the fiscal year budget. Zero-base budgeting showed that some budgetary guidelines were necessary to properly allocate the state's limited financial resources. The second advantage was an improvement in the quality of management information. Zero-base budgeting enabled key government officials to have a much greater insight into the functions of the state government. The third advantage was an increase in involvement of personnel at the activity level in the state's budgeting process; activity managers were required to prepare and rank decision packages, thus providing input into the budgeting process. The major disadvantage was the increased time and effort required for budget preparation. The two significant shortcomings were: (1) the contention that zero-base budgeting did not significantly effect the efficient allocation of the state's financial resources and (2) the apparent ineffectiveness of the decision package ranking in meeting changes in the level of funding.

A more recent work, by Logan M. Cheek entitled Zero-Base Budgeting Comes of Age, refines and amplifies the key concepts of zero-base budgeting and highlights those management techniques necessary to insure its successful implementation. The reader is again referred to this work for further information.



This study, in contrast to the nature of the works mentioned above, focused on the practical problems of implementing zero-base budgeting in a micro-level government organization. Some of the implementation problems identified by Minmier, Cheek and Phyrre were also found in the Naval Weapons Center endeavor.



II. NATURE OF THE PROBLEM

A. BASIS OF THE PROBLEM

The basis of the problem was found in the two observations which came out of the 1977 Naval Postgraduate School/Naval Weapons Center Zero-Base Budgeting Seminar discussions. The curiosity of the line managers with respect to the substance of the zero-base budgeting process appeared to be motivated by a need to reduce the uncertainties they faced as a result of the implementation efforts then underway. Collectively, they seemed to have partial knowledge of the concepts of zero-base budgeting. They seemed also to be aware of this and appeared genuinely interested in professional growth.

The line managers' discontent with the implementation efforts then extant at Naval Weapons Center seemed to be rooted in their perceptions of zero-base budgeting as a cumbersome "paper drill" which top management attempted to use as a basis for making budget cuts in selected cost categories. In one case, a "zero-base" analysis of magnetic card typewriters was conducted which resulted in a significant reduction in the number of those items throughout the installation. Subsequently, a "zero-base" analysis of computer services was conducted, but did not result in a significant reduction of costs for that category. As a result of these experiences, many managers viewed



zero-base budgeting as an additional paperwork requirement which threatened their status quo. This view was reflected in attitudes of apprehension and frustration expressed by various managers during the first two seminars.

These implementation difficulties, confirmed by management's request for outside training assistance, constituted the basis of the problem addressed in this study.

B. PROBLEM STATEMENT

This study attempted to determine if the existing literature on zero-base budgeting can adequately prepare top management for the task of implementing zero-base budgeting in a micro-level organization. Specifically, it tried to determine if the actual problems encountered in an implementation experience, compared with the problems predicted in theory, would provide any new information that would enhance the probability of successfully implementing zero-base budgeting elsewhere. The problem statement designed to answer these general questions is composed of two elements. First, does correct implementation of zero-base budgeting, with respect to the theoretical writings, lead to expected satisfactory results? Second, will incorrect implementation lead to expected problems?



III. RESEARCH METHODOLOGY

This study began with a literature survey coincident to the development of a presentation package for the seminars that were to be presented at Naval Weapons Center, China Lake. From that survey was developed a summary of zero-base budgeting theory and a questionnaire which was designed to provide raw data on the beliefs and attitudes of key management personnel at Naval Weapons Center. The questionnaires were circulated and informal interviews were conducted with selected managers. Once received, the questionnaire responses were analyzed and conclusions were drawn to complete the study. Each of these stages will be discussed in some detail below.



IV. THEORY OF ZERO-BASE BUDGETING

A. INTRODUCTION

1. Literature

The seminal work on zero-base budgeting was done by Pyhrr. His book, Zero-Base Budgeting, outlined the philosophy and procedures of zero-base budgeting and presented modifications necessary to meet the specific needs of each organization and pinpointed specific problems and possible solutions.

The previously mentioned work of Minmier on the Georgia zero-base budgeting experience cited as primary advantages: (1) development of a financial planning phase, (2) improvement in the quality of management information, and (3) an increase in involvement of personnel at the activity level. The major disadvantage was the increased time required for budget preparation. Two significant shortcomings noted were: (1) zero-base budgeting's minimal effect on financial resource allocation and, (2) ineffectiveness of decision-package ranking on funding level changes.

The work of Paul J. Stonich, of MAC, Inc., has, since 1972, extended across 75 organizations in diverse areas of the private and public sectors. His book, Zero-Base Planning and Budgeting, began by defining the zero-base process, comparing it with other budgeting



systems, and discussing the concept as it relates to the planning and control process. He then showed how the process works and how to determine who should use it and who should avoid it. The problems, both mechanical and psychological, of implementing the process were then covered. The book concludes with a chapter identifying specific functional areas of an organization where zero-base planning and budgeting applies and suggests design and implementation practices that are particularly well suited to those areas. One of the most valuable sections of the book consisted of summaries of cases describing the implementation and operation of zero-base planning and budgeting in six different companies.

The work of Logan M. Cheek of Xerox Corporation, Zero-Base Budgeting Comes of Age, developed and refined the subtleties of the zero-base process. Cheek's premise was that successful zero-base budgeting hinges on more than just a disciplined systematic set of forms and procedures. Quite a bit more is involved. In his view, its key success factors include: (1) linking the zero-base process to the long-range planning process; (2) gaining the support, involvement, and commitment of top management; (3) generating imagination by cost center managers; and (4) selling the concept and the ideas it brings to the surface. Cheek holds that, while these statements initially appear somewhat platitudinous, translating each of these principles into practical techniques is critical to success because all are necessary



and no one of them alone is sufficient. The translation of these principles into practical techniques is the substance of Cheek's work.

2. Definition and Theory Structure of Zero-Base Budgeting

Although zero base budgeting uses a number of well-known management techniques, it is not an all-encompassing planning and budgeting system. Normally it does not apply to direct labor and direct material costs. It can be used most effectively wherever administrative, indirect or discretionary costs are being considered. Pyhrr defines zero-base budgeting as:

An operating planning and budgeting process which requires each manager to justify his entire budget request in detail from scratch (hence zero-base) and shifts the burden of proof to each manager to justify why he should spend any money at all. This approach requires that all activities be identified in "decision packages" which will be evaluated by systematic analysis and ranked in order of importance.¹

Stonich defines zero-base planning and budgeting as:

A comprehensive, analytically structured process that allows management to make allocation decisions about non-direct costs.²

Zero-base budgeting is generally viewed as a decision-making process. Not all theorists agree on the number of steps in the process. However, while some minor terminology differences exist among them,

¹ Cheek, Logan M., Zero-Base Budgeting Comes of Age, p. 12, AMACOM, 1977.

² Stonich, Paul J., Zero-Base Planning and Budgeting, p. 2, Dow Jones-Irwin, 1977.



most theorists agree on the basic elements of the process itself. These basic elements of the zero-base budgeting process can be outlined in five basic steps: (1) develop planning assumptions; (2) develop decision packages; (3) rank decision packages; (4) prepare detailed budgets; and (5) evaluate performance. The analysis conducted in step two is the heart of the zero-base budgeting process.

B. ZERO-BASE BUDGETING THEORY

1. Develop Planning Assumptions

Decision packages cannot be prepared in a vacuum. Planning assumptions and guidelines concerning direction and purpose must be provided by top management to middle and lower level managers before these subordinates can develop decision packages. These assumptions serve as input to line managers in their budget preparation efforts and aid these managers in determining budget year resource requirements. Formal planning assumptions are needed for several reasons. First, they force top-level managers to do some detailed planning and goal setting for the coming budget period early in the budget cycle. Second, they provide all managers with a uniform basis for viewing the coming year and estimating resource and output requirements. Third, they provide a focal point for review/revision of planning assumptions which in turn requires the revision of decision packages affected by these assumptions. The number of revisions in assumptions can be controlled to reduce both confusion and the cycling of budget inputs in rapidly



changing environments. Finally, they readily allow managers to identify the actual expenditure variances during the operating year that are created by inaccurate assumptions provided during the budgeting process. Such formalized assumptions might include output volume in units, wage and salary increases, expected number of clients, plant and equipment changes, operational changes, probable resource needs, probable resource availability, and the expected effect of inflation.

The key characteristic of planning assumptions should be that they connect the long-range of strategic plans and goals to the budgeting process. Planning assumptions should be realistic and they should reflect clearly the programs chosen to implement long-range objectives and strategies.

2. Develop Decision Packages

The development of decision packages is a two-step process. The first step is to identify and define decision units. The second step is to analyze decision units and formulate decision packages. It is necessary to make a clear distinction between the term "decision unit" and the term "decision package." This distinction has been a point of confusion among theorists and managers alike. A decision unit has been defined as:

a discrete group of expense-creating activities around which analysis for discretionary spending decisions is centered and decision packages are developed.³

³ Stonich, p. 20.

Pyhrr defines a decision package as:

a document that identifies and describes a specific activity in such a manner that management can (1) evaluate it and rank it against other activities competing for limited resources, and (2) decide whether to approve or disapprove it.⁴

Decision units are the basic entities for which budgets are prepared. Decision units must be identified and defined as a necessary first step in implementing zero-base budgeting. Decision units may be programs, functions, cost centers, organizational units or, in certain cases, line items or appropriation items. The simplest approach may be to define decision units in terms of the present cost centers. But this need not be the only approach, nor necessarily the best. Since the zero-base concept is output or results-oriented, this could lead to defining decision units around products or markets or customer groups or geographic territories or capital projects or anything else that can be logically tied to the organization's mission or long-range objectives. A key criterion is how responsibility for resource allocation decisions is to be distributed. Decision units need to be established at an organizational level high enough so that the person responsible for the operation of the unit (the decision unit manager) has effective control over the budget dollars.

The key to zero-base budgeting lies in the analysis of decision units. Analysis at the decision unit level is the heart of the process.

⁴Pyhrr, p. 6.



It is the most time consuming and the area of most vulnerability. The analysis begins when the decision unit manager specifies his objective and the purpose of the decision unit. Following the writing of his objectives, the decision unit manager describes briefly how he operates and the resources he uses, both people and dollars. The description should set out those elements of resources which are unique to the operation, in addition to the numbers and types of employees that contribute their efforts to the decision unit. Workload and performance measurements are developed to examine the strengths and weaknesses of the manager's current approach and to describe his objective in greater detail. The essence of the decision unit analysis lies in the identification and evaluation of alternatives for each activity. Two types of alternatives should be considered when developing decision packages: (1) different ways of performing the same function (this analysis identifies alternative ways of performing a function; the best alternative is chosen and the others are discarded); and (2) different levels of effort of performing the function (this analysis identifies alternative levels of effort and spending to perform a specific function). A minimum level of effort should be established and additional levels of effort identified as separate decision packages. This minimum level of effort package may not completely achieve the purpose of the function, but it should identify and attack the most important elements. In many cases, the minimum level of effort will be between 50-90% of the current

level of operation. The minimum level of effort package would be ranked higher than the additional level(s) of effort.

In considering both types of alternatives, managers will first identify different ways of performing the same function and then evaluate different levels of effort for performing the function for whatever way or method chosen. The intent of the zero-base process is to provide a fundamental reexamination of each decision unit before its manager is permitted to proceed with the formulation of decision packages. In some instances, however, only perfunctory attention is paid to the questioning of objectives, activities and operating methods, and decision packages simply reflect the status quo. The relative emphasis placed on either of these approaches is a matter to be decided by the implementors and users of the zero-base budgeting system. Both approaches are useful, but considerations of time, practicability, and available analytic skills sometimes dictate that the former be sacrificed and attention concentrated on the latter.

In formulating decision packages, the decision unit manager puts together, in priority order, a series of decision package documents which together equal the sum total of his budget request for the decision unit. Each decision package consists of a discrete set of services, activities, functions, operations or expenditure items identified in a definitive manner for management evaluation and comparison with other activities. The highest priority package addresses the most important



activities performed by the decision unit, for example, those activities which produce the highest priority services or which meet the most critical needs of the decision unit's target population. The cost of this first package is usually well below the current level of funding for the decision unit. The first, highest priority package is often thought of as the minimum level or survival level for the decision unit, the level of service and funding below which the decision unit might as well be eliminated.

The decision unit manager's analysis of decision packages is communicated on a series of forms, using a separate form for each decision package. Each form documents: (1) precisely what services are to be provided or activities performed, if this package is funded; (2) the resource requirements of the package and their cost; and (3) a quantitative expression of workload, output or results anticipated if the package is funded. Usually, each form displays, in addition to the cost of the package, the cumulative cost of this plus all preceding (higher priority) packages in the series for the decision unit. Often the cumulative cost is also expressed as a percentage of the prior year's total for the decision unit. Similarly, the quantitative program measures are also usually accumulated and expressed as a percentage of the prior year's figure. In some cases the decision unit manager is asked to identify additional information on each decision package form, such as benefits of funding a package, consequences of not funding a package,



present services which would not be provided if only a given package and those which precede it are funded, support required from other decision units if a given package is funded, and the like.

At the same time the decision unit manager is analyzing his current and ongoing activities, he should identify all new activities and programs and develop decision packages that handle them, analyzing alternatives for different ways and different levels of effort to implement these new programs. At the conclusion of the formulation stage, the decision unit manager will have identified all his proposed activities for the coming year in decision packages that fall into one of three categories: (1) different ways and/or different levels of effort for performing the activity; (2) "Business as usual," where there are no logical alternatives, or the present method and level of effort is required; and (3) new activities and programs. The decision packages are now ready to be ranked.

3. Rank Decision Packages

Ranking is the process in which a manager reviews all decision packages (from all organization units reporting to the manager) and establishes their relative priority. The ranking process provides management with a technique for allocating its limited resources by concentrating on the questions of how much money to spend and on what to spend it.

Management answers these questions by listing all packages identified in order of decreasing benefit or importance. A running



cumulative total is kept to indicate the total budget request for the sum of each package plus all preceding (higher priority) packages. Managers can then identify the benefits to be gained at each level of expenditure and can study the consequences of not approving additional packages ranked below that expenditure level. The initial ranking should occur at the organization level where the packages are developed, so each manager can evaluate the importance of his own activities and rank his packages accordingly. The manager at the next level up the organization structure reviews these rankings and uses them as guides to produce a single, consolidated ranking for all the packages presented to him from below. Consolidation can continue until one final ranking is achieved at some desired organization level. This consolidation hierarchy usually coincides with the hierarchy of the organization, but logical groupings of similar functions may be useful even where they cut across normal organizational boundaries.

In the ranking process, attention is usually concentrated on those packages which lie within a reasonable range around the probable cutoff line, i. e., the expected funding level for the collection of decision units whose packages are being ranked. For example, if 40 packages are being ranked, it is usually not necessary to determine precisely the relative priorities among packages number one, two and three nor packages number 38, 39 and 40. It is more important to insure that those packages which fall just above and just below the probable budget



cutoff line are indeed in the order which properly reflects management's priorities.

Ranking may be performed in a variety of ways. Four common ranking approaches which enjoy widespread use are: (1) the single-standard approach; (2) the voting system; (3) the major category system; and (4) the multiple-standard approach.

In the single-standard approach, the simplest approach and the one most appropriate for families of similar programs (like capital budget requests), all packages are evaluated by one, but only one, criterion. This may be return on investment, absolute dollar savings, net present value, discounted cash flow, or benefit/cost ratios. Thus, given a list of two dozen capital investment packages, each internally sound and consistent, ranking is a five step process: (1) gain agreement on the standard to be used; (2) rank all programs using that standard; (3) determine the cutoff point in view of available resources; (4) approve and fund all packages above the cutoff level and defer or eliminate others; and (5) communicate the decision to the proper managers. The single-standard approach is simple and involves no great effort. It should not be used by managers in organizations with complicated budgeting situations.

The voting system, the earliest and most widely used, is particularly appropriate for organizations that are ranking by committee and have to array quickly a large number of packages, usually over 50. This system is also useful for an individual manager or two-member team that has to cope with a large volume of packages. The



voting system works as follows. At the first review level each member of the committee is provided a complete set of decision packages and ranking sheets. For large volumes of packages, each is copied on acetate slides for overhead projection. The committee meets, discusses each package to gain a thorough understanding of it, then votes on a fixed scale with either the average or the total points determining the ranking. The preliminary consensus on ranking is copied on a ranking sheet and projected on the overhead. The discussion then hinges on resolving differences to make sure there are no major misunderstandings. Some packages may be repositioned at this point. On resolving those differences, a final ranking is reached, converted into hard copy format, and passed to the next higher level for consideration and final decision. Ranking by voting is not an objective procedure, being subject to the inherent biases of the committee members. If it is to be of any use, it must be reviewed carefully at higher levels to correct those biases. Alternatively, the standards for voting must be explicitly spelled out, tightly administered, and understood by everybody if the end product is to be of any value.

Explicitly predefining major categories into which decision packages will be slotted and ranked is a variation of the voting system designed to overcome one of the most common games managers are known to play during voting sessions. Many managers involved in ranking tacitly (or sometimes explicitly) agree to give high ratings to



marginal packages and low ratings to those of obvious worth. Unless this behavior is detected during higher review, the budget will grow out of hand. The behavior can be effectively counteracted by forcing those responsible for ranking to place each of their decision packages into major categories. In so doing, the assumption is made that some packages are "more equal" than others. Some categories that might be predefined are (1) all efforts required by law; (2) all efforts, however small, that pay for themselves in the first year; (3) all "requirements" for a core management cadre; (4) all efforts of substantial long-term economic merit; (5) all efforts of average, but positive, long-term economic merit; and (6) all other efforts.

The third category, "all requirements" for a core management cadre, is designed for those department or section heads who often will entertain no discussion, compromise, or budgetary scrutiny of certain "sacred cows" within their territory. Even though decision packages in this category may well be of lesser economic merit, by assuring the core cadre that a limited number of decision packages are secure and protected, it may be possible for top management to gain agreement to far more drastic and needed changes in other areas. That may be a small price to pay for substantial savings. What is critical about this category is that it must be judiciously employed. The recalcitrant manager should be given only enough latitude for satisfaction, while more substantial matters are preserved in the long run.



The multiple-standards approach is based on the premise that success in implementing any decision package will depend on five issues, not all of which are economic. These are: (1) Is the program legally required? (2) Are the necessary technical skills available? (3) Will line management accept and execute the program? (4) Will the program be cost-effective? and (5) What are the economic risks of not implementing this package?

Packages that are legally required should be just that and no more. One game often played by some staff managers is to piggyback nonstatutory efforts into these decision packages. Careful scrutiny of each legally required decision package during the review process can prevent this. By identifying and segregating efforts clearly required by law, it is possible to focus on the heart of the process and its most challenging aspects: the feasibility evaluation.

Resolving the issue of technical skills requires consideration of the decision package's "state of the art" implications; for example, what are the technical problems involved? Do the skills required to overcome these problems exist inside or outside the organization? The key point in this regard is that the technical feasibility for all programs must be consistently evaluated against the same yardsticks.

The issue of line management acceptance or execution of a program requires a frank assessment of behavioral problems. What are the attitudes, policies, and management styles which characterize

the line organization? What is its structure and how does it operate? Since these elements are the most difficult to change, this issue is probably the most critical of the five. Given an unwillingness to change (or, conversely, a need for aggressive promotional efforts on the part of the staff to effect the necessary changes), the sponsoring budget center should waste little time musing about the value of such efforts, regardless of the imaginativeness of the decision package or its economic worth.

Resolving the issue of program cost-effectiveness requires consideration of the proposal's net economic benefits, using benefit-cost analysis with appropriate modifications. For all programs, the specific issue to be resolved is: What probable dollar impact can reasonably be expected from implementing the program? To answer this question, the sponsoring budget center identifies potential benefits and costs, estimates the probability of each benefit and cost, and calculates the probable dollar impact. For some programs, estimating potential benefits is often difficult. Overcoming this problem requires that benefits be estimated by either of two approaches: identifiable benefits or target benefits.

Identifiable benefits are used whenever possible. They must be tangible and clearly attributable to implementing the proposal. Target benefits are used in the absence of hard experience. In essence, these are preliminary estimates of results that the responsible staff

manager promises to deliver if given the resources to pilot-test his proposal. The goal of such pilot-testing procedures is to allocate resources toward those projects most likely to yield the greatest relative benefits and commit managers to results.

Resolving the issue of economic risks incurred by not implementing a given package is done by top management asking itself the question, "Can we afford not to act?" Failure to implement a specific program could result in unacceptable cost exposures. Failure to reevaluate continually pre-employment selection standards may result in the hiring of less qualified employees with subsequent declines in productivity.

Once every program has been evaluated on its own merits, the feasibility of each must now be determined. A decision table can be used to accomplish this. The table should be structured so that a high rating in any one factor would not conclusively decide in favor of any given program, but a low rating in any one of them would very possibly eliminate the program from consideration. The end result is that each program can be categorized into one of five categories: legally required, very desirable, moderately desirable, marginally desirable, or not worthwhile. These categories are used to classify each major program in the program ranking schedule. The legally required programs appear at the top of the schedule, and all other programs are ranked within the appropriate overall feasibility category by their economic benefits.

This program ranking schedule is the basic tool for allocating resources. Using it implies that management must undertake some

tough-minded actions, specifically: trimming marginal programs, allocating resources toward the most worthwhile projects, evaluating all new program proposals and reordering proposals as necessary, and reevaluating the entire effort as appropriate.

The acid test of an approved decision package's value is its execution. Progress in executing each package must be carefully monitored to identify bottlenecks as they develop, to chart alternatives where necessary, and ensure timely implementation and the achievement of planned benefits, particularly among high-payback packages. It is in this area that the budget staff or controller will be the prime mover.

4. Prepare Detailed Budgets

When the allocation decisions have been made, detailed budgets are prepared. The ranking schedule drawn up by management and the individual decision package forms which show all increments provide the basis for this mechanical function. This budget, although prepared in vastly different fashion than traditional budgets, is similar in format to the end product of the traditional approach. The cost data feed directly into the organization's existing budgeting and control system.

5. Evaluate Performance

Zero-base budgeting provides financial data as well as workload and performance measurements for management review. Decision unit managers can be held responsible for costs and performance. To be effective, zero-base budgeting needs to be reinforced through measurement and control. Three useful methods of evaluation are: (1) Monthly

financial review of each decision package and ranking unit: This is a traditional financial review based on budget compared to actual. It is based solely on costs expended. (2) Quarterly output review of each decision package and ranking unit: This review of the planned output of the organization is the key to the successful use of the system. The performance measurements are used to make this evaluation. (3) Quarterly (or as needed) plan and budget revisions for the organization and decision units: A process whereby orderly revisions to plans can be made is essential. This is based on performance to date and environmental factors facing the organization such as profit pressures.

Like any planning and budgeting technique, the zero-base budgeting system can easily become entangled in analytical gymnastics, both in formulating decision packages and in ranking them. This will defeat zero-base budgeting's prime objective of more rational resource allocation and quick decision making. To prevent this, both forms and ranking procedures should be kept as simple as possible.

V. THEORETICAL IMPLEMENTATION PROBLEMS

A. INTRODUCTION

Implementing a zero-base budgeting system in an organization can present a wide range of problems for management attention. Most of these difficulties can be resolved by effective management decisions and actions. The common perplexities attendant to implementation of zero-base budgeting can be categorized many different ways. The following analysis investigates seven common problem areas peculiar to the implementation of a zero-base budgeting system. While these areas are treated separately here, it should be noted that they are frequently interrelated in actual practice. The analysis will explore the major perplexities and problems of top management, of planning assumptions, of time, of individual behaviors, of administrative matters related to implementation, of decision package formulation, and of the ranking process.

B. PROBLEMS OF IMPLEMENTATION

1. Top Management Problems

The single factor most critical to the success or failure of zero-base budgeting is the support of top management. In this regard, top management includes the organization's chief executive, key lieutenants, controller and selected individuals on the budget staff or task

force who will administer the process.⁵ The support required is a firm determination, a commitment, to implement and manage change for the better. The failure of top management to take a personal stand on critical and controversial issues can undermine even the best efforts of decision-unit managers. Within an organization, doubt about top management's commitment to the zero-base budgeting system can effectively prevent its successful implementation because managers experience all the fears and problems before the benefits are realized. The decisions resulting from the critical issues mentioned above are ones with which top management will have to live, implement and defend. These are not issues or decisions that can be delegated to a support staff. They require considerable, though rewarding, time on the part of key executives. Failure to get involved and take the time required to make these critical decisions can cause the whole effort to stumble. Frequently, the missing link to success is the will to manage at the top. Sometimes the process stumbles because of lack of backbone. Often, priorities that conflict with zero-base budgeting are a factor. For example, an executive nearing retirement may find efforts required by zero-base budgeting too demanding in view of his other pursuits.

Failure of top management to provide forceful leadership is often the cause of an unsuccessful implementation effort. Unless top executives are willing to provide leadership by insisting on nothing

⁵Cheek, p. 159.

less than the best efforts of decision-unit managers, unless they are prepared to make decisions under conditions of uncertainty and unless they are willing to assign the best talents in the organization to launch and administer the process, then the benefits of zero-base budgeting have little chance of being realized.

Failure of top management to elicit and solicit ideas from all sources, subordinates and outsiders alike, will prevent the full potential of zero-base budgeting from being attained. Unless the sources of input are maximized, it is unlikely that all the relevant information necessary to decide which packages are best pursued will be brought to light.

Often, problems are created during the implementation process when top management develops unrealistic expectations for the zero-base process. The most frequent example of this is the tendency to emphasize the cost-cutting feature of zero-base budgeting. Other top managers, frequently those of organizations with serious financial problems, perceive zero-base budgeting as a panacea for a host of problems. Failure to appreciate the staff work required to implement properly zero-base budgeting can cause top management to become impatient and disillusioned with the advertised benefits of the process. Simply having expectations which are too high or expecting results too soon can cause top management to demand too much of the process or move too fast in its implementation.

Finally, failure of top management to provide sufficient, timely feedback to managers is an influential source of doubt about

the commitment of key executives to the zero-base implementation plan.

2. Planning Assumption Problems

Managers responsible for implementing the zero-base budgeting process in an organization need to specify clearly and concisely the economic and planning assumptions which will underly the budget proposals. If this is not done, a number of problems will arise:

(1) managers will make their own, differing, assumptions; (2) cooperation and coordination among related or service activities will usually be inadequate without a formal method of communicating and revising assumptions; (3) many managers, especially those fearing a loss of power, stature or responsibility attendant to major changes or those with limited vision, will not consider radically different alternatives to their current way of operating; and (4) a lot of time will be wasted unnecessarily in revising decision packages in accordance with the intended plans of top management.

3. Time Problems

When a zero-base budgeting system is being implemented, first-year time requirements for planning and budgeting may exceed those of the previous year for a number of reasons. First, more managers normally become involved in this process than were involved in the previous planning and budgeting process. Consequently, the training, communication, and administrative workload and time are

greatly increased initially. Second, there is a steep learning curve during the first year of implementation which flattens out during subsequent years. Third, in addition to budgeting, other management tasks are included in zero-base budgeting which may not have been included in the previous budget system. Goal setting, operational decision making, and control are integral parts of zero-base budgeting which require management time and attention but are often done outside of the normal budget cycle. Fourth, in a zero-base budgeting system managers spend a considerable amount of time analyzing, evaluating and setting priorities on current activities as well as new activities where previously they had focused primarily on new activities. Finally, formulating, sorting, and ranking decision packages and relating them to strategic goals are all integral components of zero-base budgeting which require numerous management decisions and consequently a significant amount of time.

4. Behavioral Problems

The behavioral problems associated with the implementation of a zero-base budgeting system can generally be categorized three ways; fears, beliefs and gamesmanship.

Managers are often fearful of any new process because of the uncertainty it represents. The zero-base budgeting emphasis on difficult decision making and priority ranking under full scrutiny of superiors is a radical and threatening change for most managers, particularly

those who prize survival and who have learned to survive by being cautious and conservative. The threats of responsibility loss, power loss, layoffs, cutbacks, and transfer are common fears of managers during their initial encounter with zero-base budgeting. The mere mention of the word "zero" frightens some people. However, the most significant problem intrinsic to the zero-base process is that it demands that management view the organization in a completely different way. In a zero-base review, no budget item can be taken for granted. The organization is viewed as though it were starting anew. Consequently, more planning is required. Planning is hard work.

Many managers, particularly those in bureaucratic organizations, hold categorical beliefs about any "new" budgeting system. Frequently, zero-base budgeting is viewed as the same old system with modifications and a different name. The belief that top management is not committed to the system may prevent many managers from giving it their best efforts. Often, the belief is held that a defense is required to survive yet another top management scheme, an exercise, to improve things. Consequently, complacency and disinterest prevail throughout the operating organization. Also, many managers believe that their particular organization is different from others and that for reasons peculiar to their organization, zero-base budgeting cannot work for them. Finally, due to misunderstandings of the purpose and the mechanics of zero-base budgeting, many managers behave in non-rational ways

toward its implementation. These behaviors range from complacency and defensiveness to outright hostility and include subtle sabotage and gamesmanship.

The dominant gamesmanship tactic used is that of including low priority programs in the minimum level of effort package and including key, high priority, activities in later increments. The effect of this, if not detected through careful review, is an arbitrarily inflated final budget.

5. Administrative Problems

The classification of implementation problems as "administrative" is a tenuous and somewhat arbitrary assignment. Although the three problem areas discussed below can be reasonably included in other problem categories, they appear to be more of an administrative nature than anything else. The three problem areas are: (1) volume of paperwork; (2) process design; and (3) achievement of benefits of program packages when the control system is based on functional accounts.

The dominant administrative problem associated with the zero-base budgeting process is the large volume of paperwork it generates. The number of decision packages created in an organization by effectively identifying each discrete activity, and several levels of effort for each, presents a formidable task for all levels of management. This information saturation problem is magnified when a substantial number of decision packages, prepared and ranked at lower

organizational levels, are subsequently divided into two or more packages, consolidated into larger packages, or deleted from the system as they progress up the organizational structure. Since management has the conflicting need to make funding trade-offs among all activities in the organization that are competing for the same resources, it must decide when the benefits derived from such information are no longer equal to the cost of obtaining it.

Unless a careful job of designing the decision package analysis and ranking forms is done, unnecessary or irrelevant data will be gathered and included in the decision packages. Consequently, the importance of determining what information will be needed as final output, and including only that on the forms, cannot be overemphasized.

In developing a process design that fits the organization culture, problems fall into two categories; structure and function. The process structure should be tailored to the organization's specific needs, rather than thoughtlessly adopted from some other organization. Some problems which the process structure should be designed to eliminate are: confusion among managers as to who is responsible for what during the implementation process (resolved by the creation of a designated task force), misdirection of planning and budgeting efforts (resolved by developing a work plan and timetable), and misinformation about zero-base budgeting (resolved by training presentations and a zero-base budgeting manual).

It is probably not possible to administer the process without setting up a task force that spends considerable time on the project. Task force members should possess good interviewing and analytic skills and should be perceived as being objective so as to encourage openness and candor in decision unit managers.

A work plan and timetable are essential so that all managers have a thorough understanding of what work is to be accomplished and when milestones are to be met.

Decision unit managers should be told through a training presentation that a zero-base system gives them a channel of communication with upper levels of management; that they have a forum for discussing problems, opportunities, and alternatives. They should also be given basic information on how the process works, general information on benefits of the system, and detailed information on their responsibilities. A manual detailing how the process works should be provided to each decision unit manager for further individual study.

Some problems which proper functioning of the process should eliminate are: doubts and conflicts among decision unit managers (resolved by assistance from task force members), lack of motivation in managers (resolved by persuasive communication of strategic goals and objectives throughout the organization by top management), and the need for validation of the efforts of decision unit managers (resolved by monitoring their output and providing feedback in the form of information, rewards, and sanctions).

The task force should report to the top executive and should consist of people familiar with zero-base budgeting and of people well versed in the organization's financial procedures. Ideally, task force members should provide individual assistance to decision unit managers, spending about one person/day of effort, in one to two hour time periods, per each manager.

Pitting managers, task forces or committees against one another does not foster innovation nor does it motivate managers to be open and straightforward about their activities (except when implementing approved programs). What is required initially is a climate of mutual support and openness in which strategic goals and objectives are persuasively communicated. An environment is developed in which each views the others as resources and not competitive threats and in which there is general feedback on performance so that all can contribute better.

While some systematic analysis of non-direct cost activities are specifically designed to be a one-time procedure, zero-base budgeting is a continuous management process. Without appropriate follow-up activity, however, the process will soon become ineffective. Therefore, to ensure the long-range success of zero-base budgeting in any organization, the process needs to be monitored and the efforts of managers need to be validated through top level evaluation and feedback in the form of rewards and penalties.

The problem of effectiveness and efficiency measurement of program benefits when the organization control system is organized in terms of functional accounts is solved by integrating zero-base budgeting with the current accounting system. Since a major restructuring of the accounting system is expensive and has significant consequences throughout the organization, integration of zero-base budgeting with the account structure is best viewed from two points of view: short-term and long-term. For the short term the budget can be summed up from the approved decision packages and for overall control purposes can be fed into the current accounting system using the accounting data contained in each decision package. To ensure proper control of packages of particular merit, they should be noted and placed in a suspense file for follow-up. For longer term purposes, restructuring the chart of accounts along program or decision package lines will improve the overall management control system. Prudence suggests investing in a major restructuring of the account system only after one or more successful years with the new process.

6. Decision Package Formulation Problems

Most of the problems of formulating decision packages are usually associated with one of the five following activities: (1) determining where decision packages are to be prepared; (2) defining workload measurements; (3) defining decision units; (4) defining the minimum level of effort; and (5) determining the decision package format.

A decision package can be created "where discrete pieces of an operation can have meaningful identification and evaluation."⁶ The consideration then becomes, "Meaningful to whom?" and "Meaningful at what organizational level?" Decision packages must be meaningful both for those preparing the packages and those reviewing them. If the packages initially prepared are summaries of several discrete pieces of an operation prepared by middle management, top level management may still be able to allocate resources satisfactorily. But, unless a detailed analysis of each discrete activity is performed, top management will never know the cost effectiveness of its operations and the benefits resulting from the participation of lower level managers, who perform the function and spend the money, will be lost. Where possible, a better approach is to identify the discrete activities upon which analyses are to be based, develop decision packages using these activities or units, and then make any summaries required when the volume of packages at any given level of review becomes too great for detailed evaluation of each package. Integral to and implicit in the choice of discrete activities are the questions of which managers will be involved in the preparation of decision packages and at which organization levels will the decision packages be ranked.

Pyhrr cites four basic considerations in determining a meaningful organization level at which decision packages should be developed:

⁶Pyhrr, p. 12.

(1) size of operation; (2) available alternatives; (3) organization level at which meaningful decisions can be made; and (4) time constraints.⁷

The size of each organization and its operations is the most influential factor on how and where decision packages are developed. Decision packages from larger organizations tend to approach discrete activities more than do those of smaller organizations, even if the smaller organization has the same set of discrete activities, because of the realistic alternatives available.

The realistic alternatives available to each manager also influence the development of decision packages. Commitments or legal contracts may inhibit or delay a recommendation that would normally be acceptable. Contracts for rental space may prohibit moves, labor contracts may inhibit management's freedom of action, and industry standard practice may eliminate some alternatives. In government, agencies are often restricted by other agencies or levels of government.

Normally, an organizational chart is the best indication of the level at which decision packages should be prepared. If a detailed cost center exists, it is a logical place to start because it was established initially for the identification and control of discrete activities.

Any undertaking is limited in what can be realistically accomplished in the time available. The depths within the organization at

⁷Pyhrr, p. 46.

which decision packages are prepared are variable within each organization, and are influenced primarily by the size of the organization, the quality of managers preparing decision packages, and the time allotted to the zero-base budgeting process. Management can also expect the first year's implementation to take longer, and have less successful results, than might be experienced in subsequent years.

Stonich points out three types of problems associated with workload and performance measurement when zero-base budgeting is implemented: (1) no such measurements have ever been established; (2) very little quantitative data is readily available; and (3) the function that such measurements serve is often not understood.⁸

The key to establishing appropriate workload and performance measurements is to get managers to review decision units in a detailed analytical fashion. This analysis will give the decision unit manager a better understanding of what his operation is doing and what it is capable of doing, thus enabling top management to evaluate more effectively potential budget revisions.

During the first year of zero-base implementation it is essential for managers to identify their key workload and performance measurements. If the data that is required for these measurements is not available, the measurements should be listed anyway with the data spaces remaining blank. In subsequent years, relevant data can be collected.

⁸Stonich, p. 78.

The importance of determining key workload and performance measurements needs to be stressed to all managers. These measurements provide top management with an effective way of evaluating the decision unit managers' effort. Also, since determination of these measurements requires decision unit managers to specify the major tasks they want performed and their major objectives, this information serves as a useful communication mechanism with top management.

Appropriate workload and performance measurements allow fair cost/benefit analyses to be made not only within a particular decision package but across increments of different decision packages. Identifying costs of a given package or increment is often simply a matter of summing expense accounts into the appropriate decision packages. Cheek points out that measuring benefits is an entirely different matter that merits special attention and any one of three approaches can be pursued: (1) the single-criterion approach; (2) the multiple-criterion approach; and (3) the opportunity cost approach.⁹

The single-criterion approach is most common where the zero-base concept is used for capital budgeting. All projects are described in decision packages. Each is evaluated in terms of either return on investment or cash flow or years to break even or some other quantifiable measure. All packages are then ranked by that single yardstick.

⁹Cheek, p. 31.

The multiple-criterion approach is normally used where the zero-base concept is applied to staff budgets. Again, all projects are described in decision packages. Each is evaluated on any one of two or three yardsticks. Those most frequently used are increased revenue, increased productivity or decreased cost of line organizations. After translating these projected benefits into dollar values, costs can be subtracted and the packages ranked in descending order of net benefit.

The opportunity cost approach can be used either in staff or capital budgeting situations. Unlike the multiple criteria approach, it is particularly useful where benefits cannot be easily related to revenues or, in some organizations, decreased costs. The estimated cost of the proposed approach is subtracted from the actual cost of the present approach to yield a net savings. The various packages of net savings are ranked in descending order.

In defining decision units, one rule overrides everything; do not lose sight of the preagreed objective for the zero-base effort. That objective, to put together the annual budget, achieve a one-shot cost reduction, or audit the effectiveness of staff programs, should drive management's thought process as decision units are defined. Cheek suggests five guidelines: (1) each package should stand alone; (2) top management should set a minimum organization level from which decision packages are to be developed; (3) each manager should be permitted to break down further his decision unit into smaller packages;

(4) focus on staff rather than on line operations; and (5) stay flexible.¹⁰

Requiring each package to stand alone permits the clear identification of all true costs of a given service. This precludes confusion during ranking if one package that supports another happens to get eliminated.

Normally, the minimum organization level for developing decision packages is a section operation of no less than five to seven people, although the minimum level could range from one to 100 people.

In breaking down decision units into smaller packages, the minimum size should be that level of effort required to complete a job meaningfully and provide some benefit to the organization. However, since the prime objective of zero-base budgeting is decision making, it should be noted that fractionalized packages defeat that purpose and create a blizzard of paperwork.

Focusing on staff vice line operations takes advantage of the crucial value of zero-base budgeting: its effect on the leverage of staff managers with respect to line operations. A one dollar investment into focused effort on the part of staff management, for example, a personnel job enrichment specialist, will likely yield a hundred fold return in line productivity.

Maintaining flexibility encourages innovation within a manager's area of responsibility. Suggestions which reach beyond his area should

¹⁰Cheek, p. 23.

also be encouraged.

There are several reasons why managers have difficulty in defining a minimum level of effort for their activities. First, the concept of a minimum level of effort is difficult to think about since it appears to be a demand for the same performance with less resources. Actually, what is being asked for is a different job than that currently being performed. The manager must focus on structural changes to the job in addition to contractions of effort to achieve the minimum. Many managers start with the notion that they are already performing at the minimum. It takes a certain amount of discussion with the zero-base task force members for most decision unit managers to understand thoroughly this concept. Second, the unwillingness of some decision unit managers to admit that there is a lower level of effort in their general responsibility area that would suffice in a demanding situation makes the identification of minimum increments difficult. They correctly sense that identifying a lower level of effort may open them up to a potential reduction of budget. This concern can be overcome when the manager understands the overall system and believes he has a fair chance to argue for and win his case during the ranking process. A third problem is frequently experienced by managers is the need to prioritize their activities within the decision unit's scope. They see the approach to different levels of effort as sequential in nature, requiring that one single activity be fully funded prior to the inclusion

of the next. The concept of variable service levels of effort within each activity that is needed to accomplish the purpose of the decision unit must be understood first. The decision unit manager can then organize his increments to include all necessary activities, albeit at variable levels of effort. This approach acknowledges the "partial, but sufficient" concept that is fundamental to zero-base budgeting.

To a large extent, the success of the zero-base process hinges on the development of minimum levels of efforts. If every minimum increment involved 100 percent of the previous year's budget, there would be no way to arrange these increments in the ranking process so that the overall budget could be reduced.

Achievement of reallocation of resources requires that true minimum increments be designated. To the extent that there are a number of increments in each decision unit between the minimum level and the current level of spending, reallocation of resources by ranking the increments is made possible.

Top management can make use of target percentages to help managers define the minimum level of effort. Any number from 50 to 90 percent of the previous year's budget can be chosen to serve as a target goal for each manager. The emphasis should be on finding the true minimum level of effort, below which no meaningful work can be accomplished. In cases where managers arrive at minimum increments which exceed their target, a special effort should be made to assist

them in analyzing their decision unit requirements. Used this way, the target percentage serves as an exception system so special analytical effort can be applied to those areas needing it the most.

The development of true minimum levels of effort depends, in addition to the analytical skill of the decision unit manager, on the degree to which the task force members ask penetrating questions, and in that way encourage managers to take a hard look at their operations.

Decision package formats will vary widely among and even within organizations, depending primarily on what management is trying to accomplish. There is no such thing as a mandatory "model" decision package. The purpose of the decision package form is to communicate the analysis and recommendations made by each manager for his activities and operations to higher levels of management for review and ranking. If managers adequately identify their discrete activities and various levels of effort, large numbers of packages are apt to be prepared, even in small organizations. Therefore, the package format must find some trade-off between length of document and desirable information displayed. In determining the format of decision packages the following ideas should be considered: (1) The information required for top management to make a funding decision must, at a minimum, include basic benefit/cost analysis, as well as any additional information specified by top management; (2) The format of the decision package can be used to specify the type of analysis

desired by top management; (3) Special and backup analysis should be attached to the basic package or made available upon request in order to limit the volume of packages; (4) Additional detailed cost information can be processed after the basic funding decisions have been made in order to save a great deal of time; and (5) The type of communication and size of the organization determine the size of the document. If decision packages are presented verbally, as can be done in smaller organizations, the package document itself can be reasonably short, giving a brief summary of the analysis. In larger organizations relying more on written communications, top management may tend to rely on summary analyses, and then possibly review the discretionary decision packages around which the final funding level will be determined.

Regardless of its purpose, each decision package should include the following elements: (1) basic identifying data, including the program name, number and level of effort, a brief description of the program's goals and objectives, as well as the sponsoring organization, cost center, author and date; (2) feasibility assessment, including details on the program's economic benefits, costs, and the risks of not acting (in addition, many organizations require an assessment of the program's legal necessity and technical and operational feasibility); (3) alternative courses of action, including the different ways considered, but not recommended, of performing the same function.

Where a decision package is being used to develop an operating budget, the package format might also include: (1) intangibles that

cannot be quantified such as improved morale or public image -- these aspects often warrant significant consideration when a difficult choice must be made between two packages of equal economic merit; (2) account level detail to facilitate translating approved packages into the existing accounting and control system; (3) a head count of exempt and non-exempt personnel associated with a given program; (4) cross-references to supporting packages though it is preferable that all packages stand alone; (5) product line allocation where management wishes to allocate staff expenses to profit centers or product lines; (6) operating ratios such as benefit/cost ratios or unit volume of sales per market analyst for analytic evaluation and comparison with other packages; and (7) the assumptions used in developing the package to ensure economic feasibility, though these are better left to an attachment.

In addition, if zero-base budgeting is used to validate a long-range plan, some forms include a cross-reference to the organization's goals. Also, functional coding by type of service activity can be included on the form to enable a computer search for redundant activities. This is particularly useful in large governmental organizations.

The inclusion of all conceivable information on the form costs time and money, and can clog the zero-base budgeting process with so much paperwork that it quickly ceases to be a useful decision making tool. The trade-off decision is between the cost and benefits

of obtaining additional information. A two-page format is probably best, as it can show enough detail to enable management to make most decisions. A three-page form is about the longest desired because of the volume problems created by additional paper. A minimum length of one page can be used in smaller organizations as a sound basis for discussion and ranking. More than one package should not be put on a single form to enable the forms to be shuffled into their order of priority for review purposes. The content and layout of decision packages is completely variable, and should be modified to fit the needs of the user organization

7. Ranking Process Problems

The ranking process is the listing of decision packages in order of decreasing benefit to the organization so that top management can determine what amount of funding the organization can afford and what packages the organization can afford to do without. While there are not a great number of problems identified with the ranking process, they are somewhat difficult to analyze because of their interrelated nature and their complexity. Two questions emerge, one fairly specific and straightforward; the other less specific and more complex. These are first, who should rank, and second, how does management satisfy the real purposes of the ranking process?

The responsibility for ranking can be given to cost center or decision unit managers, to a two-person team within a department,

to a special task force for inter- or intradepartmental work, or to the organization's budget staff.

The initial ranking should be performed by the cost center or decision unit manager who developed the packages. This allows the manager to determine and communicate views on the relative importance of various efforts with full knowledge that the ranking is subject to re-ordering during the review process at higher levels.

The value of using individual cost center managers can be enhanced by including a second manager. In large organizations, this can be the departmental planning and budgeting manager while in smaller ones it can be a financially knowledgeable staff member tasked for such an assignment during the budget cycle. The value of this approach is the complementary aspect of the team. The cost center manager has the most knowledge of decision package objectives, their technical aspects, the subtle details of the department's activities, and the scheduling and timing problems which might arise. Alternatively, the planning and budget manager, through related expertise, should command a great deal of information on the organization's objectives and strategies; on output, pricing, expense and workforce projections; and on more routine things such as salaries, productivity, absenteeism and labor turnover rates. This is simply a case of two heads being better than one. Both together are more likely to identify better solutions and create completely new alternative decision packages. .

As the ranking and consolidating process moves upward through larger organizations, the need for expertise may require a larger task force. As the number of packages under consideration increases, it quickly exceeds the ability of a single manager to deal with them. Consequently, a task force can be staffed which might include the key managers from the participating subunits of the organization. The flow of consolidation can be along either organization or functional lines.

Assigning the responsibility for ranking to the budget staff or a committee selected out of the controller's department is the least desirable solution for two reasons. First, since the ranking process is primarily an operational planning and decision making technique, and since it is the operating staff managers who will have to execute the approved rankings and implement the decision packages, assigning ranking responsibility to the budget staff diffuses accountability for the entire effort. This option includes the risk of later accusations by staff managers that the budget was not their own. Second, few controllers or their staffs have the depth of expertise to appreciate fully the subtleties of every package. Under critical circumstances this approach may be imperative however. In such a case, an independent review committee could better play the role of "organization conscience" in examining the packages and their rankings.

The question of how management satisfies the real purposes of the ranking process (provide a forum for communication and make resource allocation choices) is more difficult to answer.

During the ranking process, the basic communication needs of top management are: (1) to identify the order of priority placed on each decision package; (2) to skim the rankings to get an intuitive grasp of the types of activities as well as the dollars and people involved, and to selectively pick the packages they want to review; (3) to identify the trend between the current year's effort and the minimum level of effort identified for the budget year in order to flag for review those minimum level effort packages showing increased effort or no reduction; (4) to use a worksheet to make funding decisions among several rankings by varying the number of packages funded in each ranking thus adjusting the funding levels; and (5) to identify cumulative funding levels in order to judge the budget impact of approving any given number of packages.¹¹ All of these needs can be met through a simple, well-designed ranking form, using the decision packages for backup information purposes.

The central problem of the ranking process is actually making the resource allocation choices. Management has the need to make funding trade-offs among all activities in the organization that are competing for the same resources. The ranking process requires that all spending plans, marginal and promising, be challenged. By ranking all together, management is able to weed out marginal efforts and redirect the organization's resources toward the most promising ones.

¹¹Pyhrr, p. 78.

Two other problems, only indirectly related to the ranking process but which have a direct bearing on two problems inherent in the process (volume of decision packages for top management review and evaluation of dissimilar functions) are organization productivity and the growing complexity of staff functions. The primary responsibility for driving the productivity of an organization falls to the management staff. As efforts to improve productivity have increased, so has the size of management staffs increased. As the size, sophistication, and efforts of staffs have increased, the problems of managing staff functions have become more complex, requiring more sophisticated management efforts. While the costs of staff operations are direct and visible, the benefits are often indirect and intangible. Zero-base budgeting establishes a link between the costs of staff efforts and the results (revenue, profits, lower costs) of improved productivity and efficiency. Consequently, the ranking process enables top management to allocate and channel staff resources into the most worthwhile undertakings.

The inherent problem of volume of decision packages for top management review is the most widely acclaimed difficulty associated with zero-base budgeting. Management is faced with a dilemma. While the volume problem faced by top management is undesirable (some say impossible), ranking only at the cost center level is also unsatisfactory for two reasons: (1) ranking at the cost-center level does not identify to top management the trade-offs among cost centers or larger

organization units, and (2) lower level organization units are usually too numerous for top management to make these trade-off themselves. The solutions at this point are: (1) to limit the number of packages ranked at any one level; (2) to limit the number of consolidation levels and stop the consolidation process somewhere between the cost center level and top management; and (3) to concentrate top management's review on the lower priority, discretionary packages which fall on either side of the funding level cutoff point.

The inherent problem of evaluating dissimilar functions by managers who are unfamiliar with them can be difficult. It is partially solved by answering the "Who should rank" question addressed above. The problem can be magnified or reduced by management's ability and willingness to make evaluations of dissimilar functions. The key to the problem, however, is determining the basis for equitable comparisons. What is required is to reach some agreement as to what measurements are to be used and the value of each. Since costs are normally identified in dollars, it is often best to identify benefits expressed in some dollar measure also. Where other criteria are used, the budget staff should translate these into a common dollar value. This will ensure a common framework and common values for all concerned.

8. Summary

The problems attendant to the implementation of a zero-base budgeting system are characterized by their variety, complexity, and

their interrelatedness. Cheek points out that any given plan of implementation cited by the greatest number of organizations were issues more of management focus and direction and less of the procedural mechanics of the system itself.¹² The issues most often cited were: inadequate top management involvement, unrealistic management expectations, mediocre quality and poor timeliness of decision package submissions, insufficient feedback to decision unit managers, and inadequate or unclear planning assumptions underlying the budget proposals.

It appears pertinent at this point to consider a perspective on the problems of implementing zero-base budgeting. While it may seem banal to say that the difficulties of implementation can be overcome by effective management actions, that is, in fact, the case. The value to an organization of zero-base budgeting will be proved to an increasing degree, but over time.

During the first year, an organization gets its feet wet in the process. The results are about the same as would have been under the traditional approach. A few perceptive managers recognize its value and are quick to identify opportunities in their areas. There may be broad resistance to the paperwork problem.

During the second year, the organization moves down the learning curve. With improvements in procedures, forms, and training,

¹²Cheek, p. 163.

more managers are aware of the concept and its process. They see that carefully analyzed submissions get attention, and resources. Consequently, the packages and resource allocation are improved.

During the third year, the organization moves to the flat area of the learning curve. Only refresher training is necessary except for new managers. Top management can now devote more time to follow-up controls on the best packages from prior years and on setting up performance audits to monitor new programs. Restructuring the chart of accounts becomes a plausible idea.

Implementation is now effectively completed and during subsequent years, more benefits can be achieved.

The key point in this perspective is that the most critical period occurs at the conclusion of the first year. It is usually at that point that most of the frustrations have occurred while the benefits have not yet been fully realized. The analogy to a capital project is appropriate: Most of the costs have been incurred, but the benefits have yet to be fully realized. Organizations which discard the concept after the first year are usually blind to the implications of this perspective; they do not realize the benefits are still to come.

VI. NAVAL WEAPONS CENTER, CHINA LAKE

A. INTRODUCTION

This section describes the mission of Naval Weapons Center, China Lake, and related information. In addition, it describes briefly the major facilities, program work and resource flow underlying the operational life of the center. Finally, it describes the basic organization structure for budgeting purposes and characterizes the nature of zero-base budgeting implementation efforts to date.

B. MISSION AND RELATED INFORMATION

The mission of Naval Weapons Center is to be the principal Navy research, development, test and evaluation center for air warfare (except anti-submarine warfare systems) and missile weapon systems.¹³

In keeping with its basic mission, the center conducts in-house research, development, test, evaluation, and in-service engineering support for many types of Navy and Marine Corps weapons systems. The Center has the personnel and physical resources to develop a weapons system from the initial concept to the operational system, and then provide production and in-service support. Major areas of effort are tactical weaponry systems and components, defense suppression, air combat systems integration and support, and full spectrum test and evaluation.

¹³Naval Weapons Center Information Brief, 30 September 1976.

The Center's major projects are at the advanced engineering development level. Basic research work is concentrated in the fields of physics, geophysics, propellant combustion, and general chemistry. The exploratory development program is centered in the strike warfare weaponry area. The Center is the Navy's hub of excellence in propulsion development for small tactical missiles. It is virtually the sole laboratory working on fuses for the Navy's tactical guided missiles. It has considerable experience in the field of target acquisition and missile sensor/seekers and leads the development of anti-radiation missiles.

The Center employs over 4,500 permanent and temporary employees, more than ninety percent of whom are civilian. The FY 1977 operating budget was \$227 million, with approximately two-thirds of all funding coming from the Naval Air Systems Command.

C. MAJOR FACILITIES

The Center is located in the upper Mojave Desert of eastern California and consists of over one million acres of desert land with restricted airspace several times that size extending over the surrounding area.

The Center has thirty major test facilities available along with extensive test support services. These facilities include: Air Operations Ranges, Missile Firing Ranges, Missile Ballistics Ranges, Fuse Ranges, Supersonic Test Tracks, Explosive Test Ranges, Propulsion Test Ranges,

an Electronic Warfare Tactical Environment Simulation Facility, an Electro-Optical Field Laboratory, an Aircraft Survivability Range, an Aircraft Carrier Conflagration Control Test Facility, and a Surface Weapons Evaluation Facility.

The Naval Weapons Center has extensive laboratory facilities for the research, development, test and evaluation of weapons systems and warfare related technologies. These laboratories include: Michelson Laboratory, a complex of facilities used for research in chemistry, physics, mathematics, aerophysics, electronics, metallurgy, ballistics, and development work on propulsion, fire control and guidance systems; propulsion laboratories; a solid state research and development facility; and Lauritsen Laboratory, used primarily for laser and related optical systems research and development.

The Center has complete technical support services available to back up its mission, including instrumentation, aircraft modification, data reduction, meteorological, telemetry, computing, and machine shop services.

D. PROGRAM WORK

Program effort is directed toward air warfare systems and missile weapon systems. The principal areas of effort and their associated programs are systems development, production support and product assurance, and fleet in-service support as follows: anti-air missiles,

anti-surface weapons, tactical aircraft combat systems, and developmental and operational test and evaluation.

E. RESOURCES

Summarizing the resource flow at Naval Weapons Center entails a description of the sources of funds by provider and type, and the distribution of funds by expense category.

The FY 1977 budget of \$227 million in New Obligational Authority was provided by the five major sources listed below with an approximate percentage contribution as follows: (1) Naval Air Systems Command, 71%; (2) Other Navy sources, 12%; (3) Naval Sea Systems Command, 8%; (4) other sources, 5%; and (5) Director of Navy Laboratories, 4%.

The source of funds detailed by appropriation is as follows: (1) the Research, Development, Test and Evaluation, Navy Appropriation supplied over \$150 of the budget, slightly more than 66% of the total (Of this, nearly \$51 million, or slightly more than 22% of the total, was designated for Management and Support); (2) the Weapons Procurement, Navy Appropriation supplied \$25 million, approximately 11% of the total; (3) the Operations and Maintenance, Navy Appropriation provided nearly \$10 million, over 4% of the total; (4) the Aircraft Procurement Navy Appropriation supplied over \$6.5 million, nearly 3% of the total; and (5) other sources provided almost \$36 million, nearly 16% of the total.

The FY 1977 distribution of funds by expense category was as follows: (1) Direct Labor, \$62 million, 27%; (2) Direct Material and Travel, \$19

million, 8%; (3) Contracts, \$91 million, 40%; (4) Equipment, \$6 million, 3%; (5) Indirect Expense, \$15 million, 7%; and (6) General Expense, \$34 million, 15%.

F. BASIC ORGANIZATION STRUCTURE

The basic organization structure of Naval Weapons Center is depicted in Figure 1 on page 74. The Center uses zero-base budgeting for overhead costs. For purposes of budgeting overhead costs, the Budget Division of the Finance and Management Department separates the Center into Support Departments and Technical Departments. For Support Departments, the entire budget is considered General and Administrative Overhead, while in the Technical Departments only Cost Center Overhead is budgeted using the zero-base process, the direct expense budget being otherwise allocated. The Test and Evaluation Departments do not participate in the zero-base budgeting process. Figure 2 on page 75 provides a listing of the Support and Technical Departments used for the FY 1978 budget call. It includes a detailed listing of the Finance and Management Department.

Each Support and Technical Department has assigned to it a Resource Management Analyst (RMA) from the RMA Branch, Budget Division, of the Finance and Management Department. These analysts normally are permanently assigned to and physically located in their designated departments. The objective of this arrangement is to

NAVAL WEAPONS CENTER - BASIC STRUCTURE

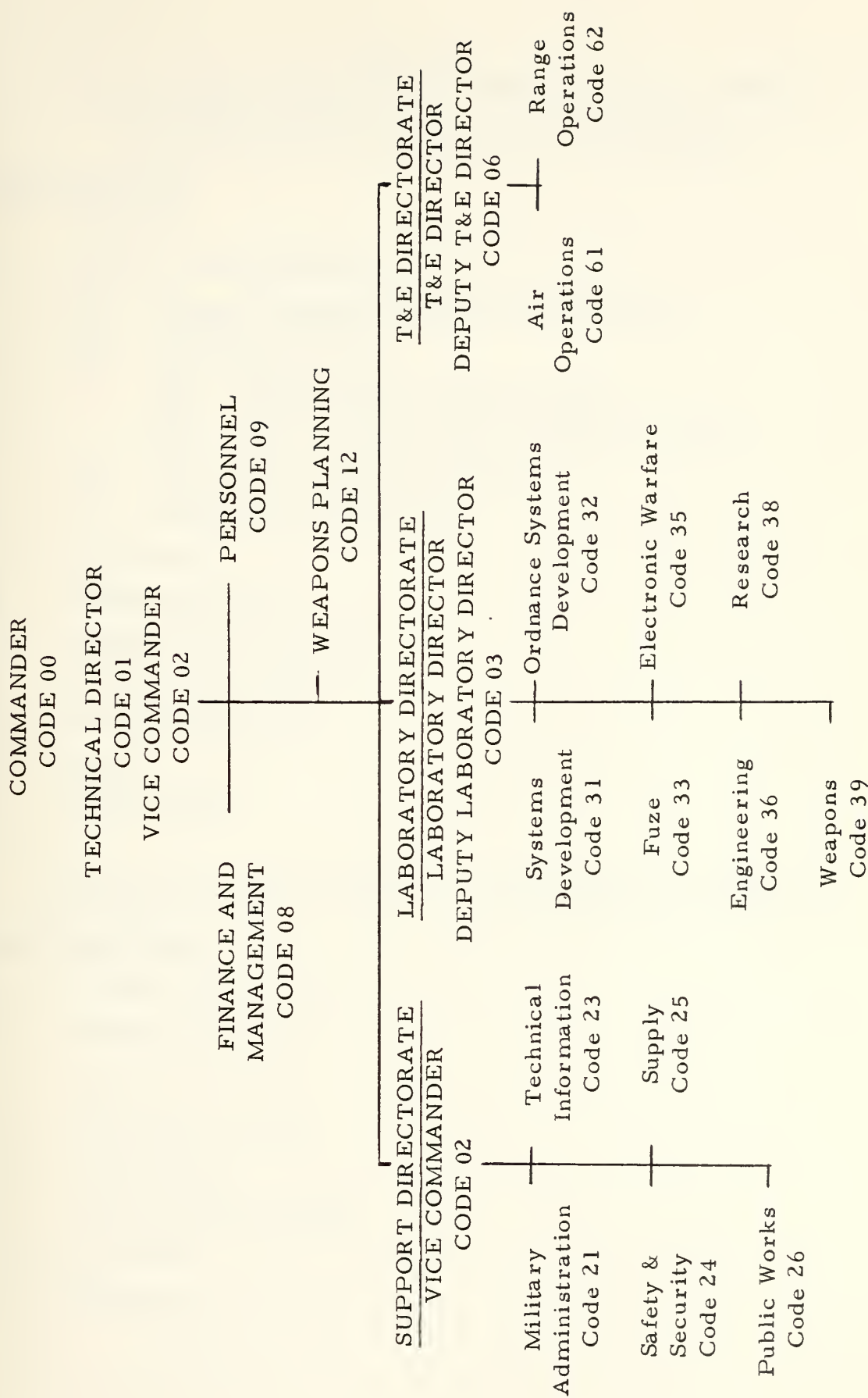


FIGURE 1

FIGURE 2
NAVAL WEAPONS CENTER - DEPARTMENTAL LISTING
SUPPORT DEPARTMENTS (G & A OVERHEAD)

<u>Code</u>	<u>Department</u>
01	Command
08	Finance and Management
081	Weapons Systems Cost Analysis Division
082	Management Division
083	Budget Division
0831	Reports and Analysis Branch
0832	Resource Management Analysis Branch
0833	Test and Evaluation Branch
086	Financial Operation Division
089	Special Services Division
09	Personnel
12	Weapons Planning
21	Military Administration
23	Technical Information
24	Safety and Security
25	Supply
26	Public Works

TECHNICAL DEPARTMENTS (COST CENTER OVERHEAD)

<u>Code</u>	<u>Department</u>
31	Systems Development
32	Ordnance Systems
33	Fuze
35	Electronic Warfare
36	Engineering
37	Engineering Prototype
38	Research
39	Weapons

integrate the budget staff with other support and technical departments and facilitate better communications, budget development, and resource allocation.

G. ZERO-BASE BUDGETING IMPLEMENTATION

The initial efforts of top management to use the zero-base budgeting process were the cost-reduction campaigns conducted on the magnetic card typewriters and the computers throughout the installation. The first efforts to implement zero-base budgeting throughout a department were made during the FY 1977 Mid-Year Review conducted in December, 1976. Two departments, a Support department (Finance and Management) and a Technical department (Weapons), were selected for the pilot test. These two departments conducted the FY 1977 Mid-Year Review using the zero-base budgeting process. The pilot test resulted in two items of significance: first was the decision to write the budget call by committee; second was a list of ten lessons learned from the pilot test.

The decision to write the budget call by committee came about in order to reduce the frustration with and distrust of the Budget Division by department managers and staffs as a result of the cost-reduction campaigns and the pilot test. The inclusion of heads of departments and staff representatives in the budget call formulation was designed to improve interdepartmental communications, trust, and cooperation.

The ten lessons learned were: (1) Decision package definition is critical. Decision units were difficult to define; managers got bogged

down in detail doing decision unit analysis and decision package formulation, and the organization unit tended to become the decision unit; (2) Mid-Year Review is not a good time to implement zero-base budgeting. Reformulating the current year budget in zero-base terms appeared to be an exercise in which the costs, in terms of time and effort, exceeded the benefits; (3) The process required too much paperwork for budget purposes. It was nevertheless evaluated as a good management tool; (4) Management must identify level of activities below the current level; (5) Incremental levels must consider travel, materials, and labor - not just labor; (6) Top management should ensure that decision unit managers understand the objectives of zero-base budgeting; (7) Top management should assure the priority of zero-base budgeting and make sure it happens; (8) Zero-base budgeting provides visibility to the department head of functions performed at the branch level and below; (9) Too many packages were formulated and the volume was difficult to manage; (10) The process was not as expensive, in terms of time and effort, as the pilot test managers anticipated. However, the refining and retyping of decision packages was deemed wasteful.¹⁴

Item (6) of the lessons learned resulted in specific education efforts by the Personnel and Organization Development Division. Key staff

¹⁴These lessons learned were presented in an unpublished command brief written in January, 1977 by N. A. Wagenhals, Head of Staff, Weapons Department.

members were sent to American Management Association Seminars on zero-base budgeting and Naval Postgraduate School was requested to develop and conduct on-site seminars for staff and management personnel.

The FY 1978 Overhead Budget Call, issued in early August, 1977, included all support and technical departments in the zero-base process for the first time.

VII. CONDUCT OF RESEARCH

A. INTRODUCTION

The research performed for this study was done from March through November of 1977. The investigation included: (1) a literature survey; (2) observations, conversations, and interviews in conjunction with the seminars given by the Naval Postgraduate School at the Naval Weapons Center from May to September of 1977; (3) formulation of the general hypothesis that Naval Weapons Center was experiencing problems implementing zero-base budgeting, most of which could be predicted from information contained in the theoretical literature; (4) development of a questionnaire to test the hypothesis; (5) circulation of the questionnaire to a target population; and (6) analysis of responses to the questionnaire and the interviews conducted in conjunction with its circulation.

B. DESCRIPTION OF THE RESEARCH INVESTIGATION

The literature survey was conducted over a six month period beginning in March of 1977. The survey consisted of periodical literature articles, newspaper articles, correspondence with organizations implementing zero-base budgeting, and the few books which have considered the subject.

The request from Naval Weapons Center, China Lake, for the Naval Postgraduate School to present training seminars on zero-base

budgeting carried with it the recognition of implementation difficulties significant enough to warrant external assistance. The observations, discussions, and interviews which occurred in conjunction with multiple offerings of the seminar were used initially to identify significant problem areas and later to substantiate specific beliefs and complaints.

The correlation between the problems, frustrations, and specific complaints expressed by Naval Weapons Center management and budget personnel and the problem areas identified in the theoretical literature gave rise to the general hypothesis stated above. From the general hypothesis was developed the two-element problem statement central to the conduct of this study and restated here: First, does correct implementation of zero-base budgeting, with respect to the theoretical writings, lead to expected satisfactory results? Second, does incorrect implementation lead to expected problems?

The questionnaire was developed to identify the problems of implementation. A number of intentions were reflected in its design. The first intention of the survey was to compare responses based on department overhead budget size in order to determine whether or not this factor affected the effectiveness of zero-base budgeting. The four categories used in question one of the questionnaire (See Appendix C) were derived from analysis of data concerning the relative sizes of the various departmental overhead budgets which were obtained in an interview with the Head of the Reports and Analysis Branch of the Budget

Division. Sufficient responses were not received to allow proper analysis in each size category. Consequently, analysis was necessarily restricted to only two categories, those departments with budgets greater than and less than \$4,000,000. Data from selected questions analyzed using this category breakdown are presented in the next section of this study.

The second intention of the survey was to compare and evaluate the views of budget analysts experienced in incremental budgeting and zero-base budgeting at Naval Weapons Center with those of budget analysts who worked only with the zero-base system. Data from selected questions analyzed using this comparison are also presented in the next section.

A third intention of the questionnaire was to identify the problems of implementing zero-base budgeting experienced at the Center by using two types of questions, unstructured and structured. The unstructured questions were designed to give managers and budget staff the opportunity to identify freely the problems they actually experienced, without reference to any anticipated or expected response. This, in conjunction with the confidential treatment of the survey, was deemed to be the most likely way to elicit accurate and candid answers. The structured questions, adapted from the questionnaire used by Minnier in his Georgia study, were designed to compare and evaluate the opinions of managers and budget staff with respect to the time required for the zero-base process, management involvement, the effectiveness of implementation

planning and guidelines, the availability of data for decision package formulation, the effectiveness of the zero-base process in affecting resource allocation decisions, the effect of the zero-base system on the quality of management information, feedback to decision unit managers regarding changes by top management in decision package rankings, the validity of minimum level of effort packages, and the future use of the zero-base budgeting system at Naval Weapons Center. Selected responses to these two types of questions are also presented in the next section of the study.

Based on the literature survey and the information gathering done in conjunction with the seminars, a number of expectations, with respect to the questionnaire responses, were developed.

First, it was expected that the respondents would be generally dissatisfied with the implementation efforts at the time of the survey. This expectation was based on the steepness of the first-year learning curve and the fact that few benefits could be seen following the expenditure of a great deal of time and effort on the budget. Second, it was expected that some degree of dissatisfaction with implementation planning and guidance on the part of top management and the budget staff would be expressed. Third, it was expected that the respondents would report that a major problem was the volume of paperwork required to perform the analysis of alternatives and the ranking of decision packages. Fourth, it was expected that some managers and budget staff would believe that

zero-base budgeting was merely an exercise in paperwork designed to satisfy top management's desires to improve budgeting methods. Fifth, it was expected that some managers would report increased awareness of and control over the functions for which they were responsible due to their involvement in the budget process.

Selection of the target population in which the questionnaire was circulated was aimed at achieving a balanced sampling of opinions from a group knowledgeable in the subject of zero-base budgeting. The questionnaire was circulated to the Resource Management Analysts in sixteen departments. Also, questionnaires were distributed to Department Heads and Division Managers in each of the two types of departments employing zero-base budgeting: Technical (Code 31 - Systems Development) and Support (Code 25 - Supply). The Test and Evaluation Directorate was not participating in the zero-base budgeting process at the time of this survey. Samples of the cover letter memorandum, the instruction sheet, and the questionnaire are presented in Appendixes A, B, and C, respectively.

A number of interviews were conducted in conjunction with the circulation of the questionnaire. Key budget staff members, particularly the Reports and Analysis and the Resource Management Analysis Branch Heads; selected Department Heads; Heads of Staff; and line managers provided the author with a clear understanding of the zero-base process used at Naval Weapons Center and the major problem areas experienced in its implementation.

The analysis of questionnaire responses was essentially a comparison between the problems reflected in the replies received and the problems expected as a result of the study of the theoretical literature and this analysis will be presented in a later section of the study.

VIII. PRESENTATION OF DATA

A. INTRODUCTION

This section will present the data that was obtained from twenty-five survey questionnaires that were completed and returned by the budget analysts and managers at Naval Weapons Center, China Lake. This represents a response rate of 45.5%. Six different displays are used to exhibit the data. Table I presents an aggregate summary of responses to the survey questionnaire. The distribution of responses for each question is shown by number of responses and percent of total responses received for that particular question.

Table II shows selected responses based on the size of departmental overhead budget, using \$4,000,000 as a dividing point. As previously noted, one of the original intentions of the survey was to compare responses based on department overhead budget size. The range of these overhead budgets was from just under one half millions dollars to over nine and one half million. The four categories selected were intended to provide a group of four equally sized sets of responses upon which analysis could be made. Sufficient responses were not received to allow proper analysis in each category. Consequently, analysis was necessarily restricted to two categories, those departments with an overhead budget greater than and less than \$4,000,000. This grouping

arrangement provided two reasonably equal sets of responses. The questions selected were chosen for the statistical distribution of their responses, which varied significantly from the aggregate distribution. The variant character of these responses makes them candidates for analysis. In each of the two categories of department size, the distribution of responses is shown by number of responses and percent of total responses received in that particular category. Additionally, the total number of responses, and a percentage breakdown of that total, is shown for each question. This repetition of the aggregate data from Table I is done merely to assist the reader in correlating the data shown in the various displays.

Table III presents selected responses based on whether or not the respondent participated in the original implementation of zero-base budgeting. The same display format is used here as in Table II.

The last three displays deal with the written comments of respondents. These comments are summarized for the two unstructured questions (numbers 4 and 5 on the questionnaire) in Table IV, for the structured questions which elicited comments (numbers 10, 14, 15, 16, and 19) in Table V, and for the General Comments sheet at the back of the questionnaire in Table VI. In these displays, the Response Data gives a brief statistical look at the relative magnitude of responses to a particular question, using the 25 returned questionnaires as a base. The Response Summary provides a condensed, abridged version of all

the comments received regarding a particular question. These summaries were created using a great deal of subjective evaluation and interpretation. The written comments, the opinions and beliefs of the respondents, were read, summarized, interpreted, compiled, and displayed by the author, to show the range and depth of attitudes and beliefs held by the respondents without excessive detail. Often, similar responses were grouped together and the number of responses within a given category of comments were given in parentheses to provide the reader with a better understanding of the major attitudes and beliefs pervading the target population. There is no relationship between the number of responses shown in the Response Summary and the number shown in the Response Data display. Many responses expressed several problems or attitudes or beliefs which could be interpreted any number of ways. Several comments were seemingly inappropriate to the question and were consequently omitted from the summary.

B. PRESENTATION OF DATA

Tables I through Table VI are presented in the following pages.

TABLE I
QUESTIONNAIRE: ZERO-BASE BUDGETING
SUMMARY OF RESPONSES - AGGREGATE

Question Number	TOTAL	
	No.	%
1. Size of Department based on FY-77 allocation of funds for indirect expenses:		
> \$4,000,000	9	36.0
> \$2,000,000	12	48.0
> \$1,000,000	2	8.0
< \$1,000,000	2	8.0
2. Were you "budget analyst" of your department during the original implementation of ZBB?		
Yes	13	52.0
No	12	48.0
3. In your opinion, is ZBB an improvement over the previous budget system at NWC?		
Yes	5	20.0
No	14	56.0
Uncertain	6	24.0
6. What effect did the ZBB system have on the time and effort spent in budget preparation during the first year of its implementation?		
Increased considerably	20	83.3
Increased slightly	3	12.5
About the same	1	4.2
Decreased slightly	0	
Decreased considerably	0	

Question Number	TOTAL	
	No.	%
<hr/>		
7. Now that the ZBB system has been implemented, how great is the time and effort spent in budget preparation in comparison to the previous budget system?		
Much greater	13	61.9
Slightly more	6	28.6
About the same	2	9.5
Slightly less	0	
Much less	0	
<hr/>		
8. Did the Department Head become more involved in budget formulation after implementation of ZBB?		
Much more involved	3	12.5
Slightly more involved	5	20.8
About the same	14	58.3
Slightly less involved	1	4.2
Much less involved	1	4.2
<hr/>		
9. Did the first-line supervisors become more involved in budget formulation after the implementation of ZBB?		
Much more involved	13	52.0
Slightly more involved	3	12.0
About the same	9	36.0
Slightly less involved	0	
Much less involved	0	
<hr/>		
10. Do you feel adequate advance planning on the part of Department 08 was conducted before implementation of the new ZBB system?		
Yes	4	16.0
No	20	80.0
Uncertain	1	4.0

Question Number	TOTAL	
	No.	%
11. Do you feel you received adequate instructions during the first year of ZBB to properly prepare your budget requests:		
Yes	10	40.0
No	14	56.0
Uncertain	1	4.0
12. Do you feel you presently have adequate instructions as to how to properly prepare a zero-base budget?		
Yes	13	54.2
No	8	33.3
Uncertain	3	12.5
13. During the first year of operating with the ZBB system did you have adequate cost data available to properly prepare decision packages?		
Yes	11	52.4
No	7	33.3
Uncertain	3	14.3
14. Do you feel you presently have adequate cost data necessary to properly prepare a decision package?		
Yes	14	60.9
No	7	30.4
Uncertain	2	8.7
15. Did implementation of the ZBB system cause a shifting of financial resources among functions in your department?		
Large shifting	1	4.4
Some shifting	5	21.7
No apparent shifting	15	65.2
Uncertain	2	8.7

Question Number	TOTAL	
	No.	%

16. All good management systems generate information for management planning and control. What effect did the ZBB system have on the quality of management information as compared to the previous budget system?

Substantially improved	1	4.8
Slightly improved	7	33.3
About the same	10	47.6
Slightly decreased	3	14.3
Substantially decreased	0	

17. After your department has submitted its decision package rankings for executive review, are you notified of any changes in these rankings and the reason for the change?

Always	2	25.0
Most of the time	2	25.0
Seldom	0	
Never	4	50.0

18. Presently, you are required to prepare decision packages representing different levels of effort for each function. Do you feel it is practical to prepare a decision package representing a minimum level of effort?

Yes	16	72.7
No	6	27.3
No opinion	0	

Question Number	TOTAL	
	No.	%

19. This study is very interested in your opinion of the zero-base budgeting system. Which of the following choices do you feel is in the best interest of NWC, China Lake?

Continue the ZBB system substantially as it operates today.	3	14.3
Continue the ZBB system with some major modifications.	5	23.8
Continue the ZBB system except that it not be employed every year.	4	19.0
Discontinue the ZBB system.	9	42.9

TABLE II
SELECTED RESPONSES BY SIZE OF DEPARTMENT
BASED ON FY-77 ALLOCATION OF FUNDS
FOR INDIRECT EXPENSES

Question Number	< \$4,000,000		> \$4,000,000		TOTAL	
	No.	%	No.	%	No.	%
3. In your opinion, is ZBB an improvement over the previous budget system at NWC?						
Yes	3	18.8	2	22.2	5	20.0
No	12	75.0	2	22.2	14	56.0
Uncertain	1	6.2	5	55.6	6	24.0
8. Did the Department Head become more involved in budget formulation after the implementation of ZBB?						
Much more involved	3	18.8	0		3	12.5
Slightly more involved	4	25.0	1	12.5	5	20.8
About the same	9	56.2	5	62.5	14	58.3
Slightly less involved	0		1	12.5	1	4.2
Much less involved	0		1	12.5	1	4.2
9. Did the first-line supervisors become more involved in budget formulation after the implementation of ZBB?						
Much more involved	6	37.5	7	77.8	13	52.0
Slightly more involved	2	12.5	1	11.1	3	12.0
About the same	8	50.0	1	11.1	9	36.0
Slightly less involved	0		0		0	
Much less involved	0		0		0	

Question Number	<\$4,000,000		>\$4,000,000		TOTAL	
	No.	%	No.	%	No.	%
13. During the first year of operating with the ZBB system, did you have adequate cost data available to properly prepare decision packages?						
Yes	9	60.0	2	33.3	11	52.4
No	5	33.3	2	33.3	7	33.3
Uncertain	1	6.7	2	33.3	3	14.3
14. Do you feel you presently have adequate cost data necessary to properly prepare a decision package?						
Yes	12	75.0	2	28.6	14	60.9
No	4	25.0	3	42.8	7	30.4
Uncertain	0		2	28.6	2	8.7
16. All good management systems generate information for management planning and control. What effect did the ZBB system have on the quality of management information as compared to the previous budgeting system?						
Substantially improved	1	6.7	0		1	4.8
Slightly improved	3	20.0	4	66.6	7	33.3
About the same	9	60.0	1	16.7	10	47.6
Slightly decreased	2	13.3	1	16.7	3	14.3
Substantially decreased	0		0		0	

Question Number	<\$4,000,000		>\$4,000,000		TOTAL	
	No.	%	No.	%	No.	%
19. This study is very interested in your opinion of the zero-base budgeting system. Which of the following choices do you feel is in the best interest of NWC, China Lake?						
Continue the ZBB system substantially as it operates today	1	7.2	2	28.6	3	14.3
Continue the ZBB system with some major modifications	3	21.4	2	28.6	5	23.8
Continue the ZBB system except that it not be employed every year	3	21.4	1	14.2	4	19.0
Discontinue the ZBB system	7	50.0	2	28.6	9	42.9

TABLE III

SELECTED RESPONSES BASED ON
PARTICIPATION OR NON-PARTICIPATION
IN ORIGINAL IMPLEMENTATION OF ZERO-BASE BUDGETING

Question Number	BUDGET ANALYST PARTICIPATING IN ORIGINAL IMPLEMENTATION OF ZBB?					
	YES		NO		TOTAL	
	No.	%	No.	%	No.	%
6. What effect did the ZBB system have on the time and effort spent in budget preparation during the first year of its implementation?						
Increased considerably	8	66.7	12	100.0	20	83.3
Increased slightly	3	25.0	0		3	12.5
About the same	1	8.3	0		1	4.2
Decreased slightly	0		0		0	
Decreased considerably	0		0		0	
11. Do you feel you received adequate instructions during the first year of ZBB to properly prepare your budget requests?						
Yes	8	61.5	2	16.7	10	40.0
No	5	38.5	9	75.0	14	56.0
Uncertain	0		1	8.3	1	4.0
14. Do you feel you presently have adequate cost data necessary to properly prepare a decision package?						
Yes	5	41.7	9	81.8	14	60.9
No	5	41.7	2	18.2	7	30.4
Uncertain	2	16.6	0		2	8.7

BUDGET ANALYST PARTICIPATING
IN ORIGINAL IMPLEMENTATION OF
ZBB?

Question Number	YES		NO		TOTAL	
	No.	%	No.	%	No.	%
19. This survey is very inter- ested in your opinion of the zero-base budgeting system. Which of the following choices do you feel is in the best interest of NWC, China Lake?						
Continue the ZBB system substantially as it op- erates today	0		3	27.3	3	14.3
Continue the ZBB system with some major modifications	2	20.0	3	27.3	5	23.8
Continue the ZBB system except that it not be employed every year	4	40.0	0		4	19.0
Discontinue the ZBB system	4	40.0	5	45.4	9	42.9

TABLE IV

SUMMARY OF RESPONSES TO UNSTRUCTURED QUESTIONS
ABOUT
PROBLEMS EXPERIENCED AND BENEFITS IDENTIFIED
DURING IMPLEMENTATION

QUESTION #4: List the major problems you have experienced or know about resulting from the implementation of ZBB at NWC, China Lake. Briefly describe each.

RESPONSE DATA: 23 of 25 responses stated problems (92%)
2 of 25 responses were blank (8%)

RESPONSE SUMMARY:

Problem Description (Number of responses, if more than one)

1. Paperwork (6)
2. Line managers not involved (5)
3. Lack of guidance in preparing decision packages (4)
4. Implementation/budget preparation timetable too short (3)
5. Inadequate training (3)
6. Inadequate preparation for implementation (2)
7. Lack of definition of goals (2)
8. Difficulty defining decision units (2)
9. Required increase in budget preparation time (2)
10. Too many people involved (2)
11. ZBB was misapplied initially (2)
 - Typewriters/computers
 - " .. rammed down peoples' throats"
12. NWC process is not really zero-based (2)
 - (Base-line and Increment line)
 - "I feel a lot of base-line could be cut also. "
13. Lack of flexibility due to government regulations (2)
14. Double standard; separation of functional package approvals from personnel ceilings and travel guidelines (2)
15. Required a major learning exercise to understand
16. Inconsistencies between training and budget staff advice
17. Decisions by wrong people - should be Department, not Code 08
18. ZBB raises unrealistic expectations about management involvement in budget process

19. Irritates Department Heads - encourages "gaming"
20. ZBB process is easy to "game"
21. Department Head would not submit incremental decision packages
22. Department Head would not rank packages
23. Division Heads do not have adequate background to do groundwork for zero-base budget
24. Realistic alternative methods difficult to define
25. ZBB is not useful for decisions about major operating areas
26. ZBB is not useful in technical departments
27. Hard to rearrange priorities after original submissions
28. Hard to monitor various submissions; there is little uniformity between submissions of different departments
29. Arbitrary decisions by "bosses" degraded the whole concept
30. Widespread negative attitude degraded the "practice" of ZBB
31. Process puts peculiar burden on managers who try to do things "right"
32. Honest managers wind up with "bare-bones" budgets
33. Managers have very little discretionary funds
 - a. salaries are largest part of budget
 - b. line managers/supervisors don't have ability to pick and choose Civil Service Employees
 - c. Therefore, decision-makers cannot match dollars to functions, except on the basis of personnel.
Changes in personnel ceilings cause problems.
34. Difficulty extracting prior-year expense data for formulating decision packages at Division/Branch level
35. Extra effort to convert functional decision packages to the reporting system which uses objects of expense
36. Too much effort for no apparent benefit
37. "The standard criticism is that we went into a vast program with half-vast preparation and training."

QUESTION #5: List the major benefits you have experienced or know about resulting from the implementation of ZBB at NWC China Lake. Briefly describe each.

RESPONSE DATA: 13 of 25 responses stated positive benefits (52%)
 3 of 25 responses stated doubts about or hopes of benefits (12%)
 5 of 25 responses stated "none" (20%)
 4 of 25 responses were blank (16%)

RESPONSE SUMMARY:

Benefit Description (Number of responses, if more than one)



1. More line managers were involved in the budget process (3)
2. Line managers have a better view of the overall cost of operations (2)
3. Managers have a better understanding of budget principles (2)
4. There was an increased awareness of organization priorities - primarily in the Support Departments.
5. Managers have a better view of the overall problems of the organization
6. Managers know more about where and when dollars are being spent. They are aware of overhead needs and costs
7. Supervisors were forced to think about their work functions
8. The scrutiny of functions and testing for validity of overhead costs enabled managers to determine what functions could be eliminated without crippling the department's mission effort.
9. Branch managers know more about the financial operations of their functional areas and are more aware of budget constraints.
10. ZBB is a useful planning tool; it is an improvement over the previous system
11. If the people making the budget have the desire, ZBB can be used to present a more coherent, organized explanation of their budget request
12. It is easier to complete the budget forms after the packages are done
13. "I believe that ZBB will be more effective if the Center perseveres for a couple more years. "

TABLE V

SUMMARY OF COMMENT RESPONSES
TO SELECTED STRUCTURED QUESTIONS

QUESTION #10: Do you feel adequate advance planning on the part of
Department 08 was conducted before implementation
of new ZBB system?

RESPONSE DATA: 16 of 25 responses conveyed comments (64%)
9 of 25 responses were blank (36%)

RESPONSE SUMMARY:

Comment Description (Number of responses, if more than one)

1. Inadequate guidelines were given to budget and staff departmental line managers involved in the budget process. (8)
 2. Code 08 personnel and departmental staff and managers had difficulty understanding and/or explaining ZBB and how to implement it. (5)
 3. Too much time was taken to prepare the budget call. (4)
 4. Code 08 tried hard to plan things well. (4)
 5. Not enough time was allotted for Code 08 to do advance planning. (3)
 6. Unrealistic deadlines and expectations of top management made respondents feel that "ZBB was crammed down our collective throats." (2)
 7. The redirection of efforts caused by Code 08 changing guidelines after they were issued kept budget staff and line managers "off balance." (2)
 8. Communication was poor. (2)
 9. Training was inadequate.
 10. Not enough time was allotted to review and rework decision packages.
-

QUESTION #14: Do you feel you presently have adequate cost data
necessary to properly prepare a decision package?

RESPONSE DATA: 7 of 25 responses conveyed comments (28%)
18 of 25 responses were blank (72%)

RESPONSE SUMMARY:

Comment Description

1. Presently, costs are not collected by the functional area, however, they will be in FY-78.
2. Hard to track prior years - don't know how much contracts will cost.
3. We will need some revised financial reports to get helpful cost breakouts - some revisions are in process.
4. The billing system, in some cases, doesn't lend itself to breaking costs out to the proper function they support.
The budget is still a product of the Analyst vice the Manager.

QUESTION #15: Did implementation of the ZBB system cause a shifting of resources among functions in your department?

RESPONSE DATA: 8 of 25 responses conveyed comments (32%)
17 of 25 responses were blank (68%)

RESPONSE SUMMARY:

Comment Description (Number of responses, if more than one)

1. Too soon to tell. (3)
2. Certainly a shifting of "control/responsibility."
3. We are already operating with a minimum dollar amount in our department.
4. We had our own little system. ZBB simply formalized it and provided forms and format.
5. How could it? Management didn't read it. Department heads had the same two hours available for budget review they've always had and there was too much material to digest.

QUESTION #16: All good management systems generate information for management planning and control. What effect did the zero-base budgeting system have on the quality of management information as compared to the previous budgeting system?

RESPONSE DATA: 8 of 25 responses conveyed comments (32%)
17 of 25 responses were blank (68%)

RESPONSE SUMMARY:

Comment Description (Number of responses, if more than one)

1. Unable to see any effect. (2)
2. Too early to tell (2)
3. Quality decreased due to lack of communication, foul-ups in getting the word out to all concerned; the usual first time around problems of education and implementation.

4. Quality increased only because we had the desire and intent to use ZBB as a vehicle to improve it. Such improvement is not inherent to the system.
 5. Improvement is possible if department heads and top management really use the information available.
-

QUESTION #19: This study is very interested in your opinion of the zero-base budgeting system. Which of the following choices do you feel is in the best interest of NWC, China Lake?

RESPONSE DATA: 14 of 25 responses conveyed comments (56%)
11 of 25 responses were blank (44%)

RESPONSE SUMMARY:

Comment Description (Number of responses, if more than one)

1. Too early to tell; need more time to evaluate it. (7)
2. The extra work didn't produce any benefits. (3)
3. Our process, with base-lines and increment lines, is not really a zero-base system.
4. The implementation time frame was too short. Code 08 spent a lot of time trying to publish a good budget call by involving all the various department and staff people. I don't feel the call was any better, it just took longer.
5. The large amount of "gaming" could be eliminated by a hard-nosed review.
6. The process should be used in the support departments only.
7. The ZBB system should be used as an Overhead budgeting process only, not as a cost-cutting tool (the typewriter fiasco).
8. Our ZBB system bears no relationship to overhead generated.
9. ZBB should be an optional technique used in applications where it has obvious advantages.

TABLE VI
SUMMARY OF RESPONSES
TO GENERAL COMMENTS SECTION

GENERAL COMMENTS

RESPONSE DATA: 10 of 25 responses conveyed comments (40%)
15 of 25 responses were blank (60%)

RESPONSE SUMMARY:

Comment Description

1. If ZBB results in a real improvement in understanding about the major overhead users (the Support Departments), then we'll have a handle on the utility of the system.
2. The process of combining, amalgamating, and condensing the input and rankings from the depths of the organization is critical, peculiar to the organization and managers in question, poorly systematized, and little understood.
3. The value of ZBB has been to the line managers who have been forced to think about things which, previously, they were willing to let lie. The method of defining needs and establishing priorities has been good for line managers. They have a better understanding and appreciation for the budgeting process. Their "hands-on" experience has been beneficial.
4. I have a very positive attitude toward ZBB. I could have gotten a great deal of gratification from using it had I not had to witness the agony of so many others.
5. We needed more time to prepare the budget.
6. ZBB is OK but more practice is needed by first-line supervisors, particularly in cost matters. Cost data is often difficult to obtain.
7. The Typewriter/Computer cost-cutting calls gave ZBB a bad name. Those events tended to reduce the authority of line managers - contrary to ZBB.
8. My concern is about the frustration of line managers created by the lack of adequate instructions/directions from higher levels and the frequent changes to those instructions.
9. I'm not convinced that ZBB is an improvement over our previous overhead budgeting methods. It did not get our line managers involved and we did end up with more paper-work.

10. I thought the primary purpose of ZBB was to start with zero and build a budget. We had three constraints to this: (1) prior year experience had to be listed; (2) base-line and increment-line figures were determined using historical cost data and the ability of each cost center to generate overhead rather than actual needs; and (3) the reporting system uses objects of expense while the budget system is based on functions. To me, the end result appeared to be a new way to come up with the same old budget figures.

IX. ANALYSIS OF DATA

A. INTRODUCTION

This section will present an analysis of the data displayed in the preceding section. First, an analysis of the aggregate summary of responses to the zero-base budgeting questionnaire (Table I) will be shown. Next will be an analysis of selected responses by size of department, based on FY-77 allocation of funds for indirect expenses (Table II). Third will be an analysis of selected responses based on respondent participation or non-participation in original implementation of zero-base budgeting (Table III). Fourth, some comments on responses to the two unstructured questions (Table IV) will be presented, and finally, some comments on Tables V and VI will be made.

B. ANALYSIS OF THE AGGREGATE SUMMARY OF RESPONSES TO THE ZERO-BASE BUDGETING QUESTIONNAIRE (Table I)

The distribution of responses to Question 3 clearly reflected moderate dissatisfaction with the zero-base system among the members of the population. The 24 percent of the population who were uncertain about the relative quality of the zero-base system over the previous budgeting system implied a balanced skepticism about the new system. The 80 percent who were either uncertain or held a negative opinion about Question 3 substantiates the earlier expectation that the end of



of the first year would be the most difficult period during the implementation process.

Cross-analyzing; in Question 3, only 20 percent of the population felt that zero-base budgeting was an improvement over the previous system yet, in Question 19, 57.1 percent of the population decided the best interests of Naval Weapons Center, China Lake, would be served by continuing the zero-base system in one form or another. The mixed implications of these responses implied that the uncertainty among the target population was possibly higher than the responses indicated. The 42.9 percent response in Question 19 to discontinue the system was again consistent with the expectation that the greatest resistance to the system would arise at the end of the first year.

Questions 6 and 7 clearly showed that the respondents believed zero-base budgeting increased the time and effort spent in budget preparation. The differential in response distribution between the two questions reveals a small movement down the learning curve following the two-department, zero-base budgeting introduction experience in December of 1976.

Questions 8 and 9 indicate that a third of the respondents believed that department heads, and nearly two-thirds believed the first-line supervisors, became more involved in the budget formulation process after the implementation of zero-base budgeting than had been the case previously. This greater management involvement supported the

prediction of increased awareness about, and control over, the functions for which the managers were responsible. A cross-analysis of the nine responses to Answer Number 4 (Discontinue ZBB) on Question 19 was performed on these two questions. For Question 8, no significant proportionate distribution differences were found between the nine who chose to discontinue the system in Question 19 and the aggregate population of 24 in Question 8. For Question 9, however, the response distributions of the nine respondents in Question 19 and those of the aggregate population of 25 in Question 9 were significantly different. Of the nine respondents, one third (3 of 9) indicated much more involvement by the first-line supervisors (the remaining six all indicated "About the same" involvement). A comparison between the two distributions (the 33.3 percent of the nine responses to Question 19 and the 64.0 percent - 12 percent "Slightly more" plus 52 percent "Much more" - of the aggregate population in Question 9) of increased supervisory involvement, implies that those recommending discontinuance of the zero-base budgeting system had seen much less change in first-line supervisory involvement than the population as a whole.

Regarding Question 10, the reader is first referred to Table V for a summary of the comments which were made. A preponderance of the population stated that the Office of Finance and Management, Code 08, did not conduct adequate planning before implementation of the zero-base budgeting system. The primary problems related to guidance, understanding, and ability to explain zero-base budgeting. Nearly all the

comments were in line with the expectation that dissatisfaction with the zero-base implementation efforts would manifest itself as criticism of the planning and guidance on the part of top management and the budget staff.

The effect of training and instruction in zero-base budgeting techniques was reflected in Questions 11 and 12. The ratio of respondents who felt inadequately trained or uncertain about their knowledge of zero-base budgeting to the total population dropped from 60.0 percent in Question 11 to 45.8 percent in Question 12. Generally, this occurred during the period between December, 1976 and August, 1977. This decrease was most likely the result of internal training programs, contractor-provided instruction, the Naval Postgraduate School seminars, and self-instruction on the part of many individuals involved with zero-base budgeting at China Lake.

Questions 13 and 14 revealed a slight improvement in the availability of cost data necessary to prepare an adequate decision package. The reader is referred to Table V for a summary of the comments made on Question 14.

Question 15 indicated that over 26 percent of the respondents experienced some shifting of resources among the functions performed in their departments, yet the summary of comments (Table V) made on this question tended to reflect the preponderant response that no apparent shifting of resources occurred. A cross-analysis was performed between

Question 19, Answer Number 4 (Discontinue ZBB), and this question.

Of the nine respondents who wanted to discontinue the zero-base system in Question 19, eight had responded to Question 15; and the distribution of their responses approximated proportionately the responses of the aggregate population to that question. A cross-analysis of the three response categories in Question 19 which recommended continuing the zero-base system was performed on Question 15 also. Distribution of those 12 responses from Question 19 likewise approximated, proportionately, the responses of the aggregate population to Question 15. No correlation between either acceptance or rejection of zero-base budgeting and re-allocation of resources could be found.

Eight of the 21 respondents (38.1 percent) to Question 16 perceived an improvement in the quality of management information. This improvement bears out the expectation that some managers would report increased awareness of and control over their functional areas of responsibility. The summary of comments made (Table V) reveals a mixed view.

Question 17 was deleted from consideration for analysis because it was subsequently deemed to not have been an appropriate question at the time of the survey because the ranking process had not yet been started at the Center.

The distribution of responses to Question 18 implies that a majority of the population understands the concept of a minimum level of effort package as it relates to the process of zero-base budgeting. That the significance of the minimum level of effort package was understood by

respondents is best shown by the comments (particularly Comment Number 3 for Question 19 in Table V and Comment Number 10 in Table VI) made about the base-line and increment-line figures which were imposed as budget guidelines. The respondents who commented seemed to think that the base-line/increment-line amounts defined the range outside which decision packages would not be reviewed. This was substantiated by the center budget call memorandum. The avowed purpose of the base-line/increment-line amounts was to control the number of packages presented for detailed review. The existence of such guidelines, which may serve well as a control mechanism over the number of decision packages to be reviewed, nevertheless alters the character of the budget process from a true zero-base system to a modification thereof.

Question 19 reflects the expected dissatisfactions with zero-base budgeting at the end of the first year of its implementation. This question has been cross-analyzed with Questions 3, 8, 9, and 15. As noted previously, 57.1 percent of the 21 respondents recommended that the best interests of Naval Weapons Center, China Lake would be served by continuing the zero-base system.

C. ANALYSIS OF SELECTED RESPONSES BY SIZE OF DEPARTMENT BASED ON FISCAL YEAR 1977 ALLOCATION OF FUNDS FOR INDIRECT EXPENSES (TABLE II)

Question 3 revealed that respondents from departments with smaller overhead budgets, which tended to be the technical departments, considered zero-base budgeting to be no improvement over the previous

system. Conversely, those respondents from departments with larger overhead budgets, generally the support departments, tended to be more uncertain about the value of the zero-base system.

Question 8 showed that, while approximately an equal number of respondents reported the department head's involvement was about the same, those respondents in departments with smaller budgets experienced much more department head involvement while those respondents in the departments with larger budgets reported a decrease in department head involvement.

Question 9 disclosed that, in the departments with bigger overhead budgets, significantly more first-line supervisors were involved in budget formulation than was the case in the departments with smaller overhead budgets.

Questions 13 and 14 revealed that significantly more respondents in departments with smaller overhead budgets had adequate cost data necessary to properly prepare decision packages than did respondents in departments with larger overhead budgets. Also, the response distribution ratios remained approximately the same, from the initial two-department experiment with zero-base budgeting (Question 13) to the present Center-wide implementation (Question 14).

Question 16 clearly showed a differential in perceptions about the quality of management information between the two department sizes with the larger departments perceiving more improvement than the

smaller departments. A sample size of six for the large department response makes this statement tenuous.

Question 19 disclosed that the respondents from smaller departments recommended discontinuing the zero-base budgeting system significantly more frequently than did those from the larger departments. It appears that the technical departments were less interested in zero-base budgeting than were the support departments.

D. ANALYSIS OF SELECTED RESPONSES BASED ON PARTICIPATION OR NON-PARTICIPATION IN ORIGINAL IMPLEMENTATION OF ZERO-BASE BUDGETING (TABLE III)

Question 6 indicates that, while virtually all respondents experienced an increase in the time and effort for budget preparation during the first year, 100 percent of the respondents who did not participate in the original implementation of zero-base budgeting felt it required a "considerable increase" in time and effort. In Question 11, three fourths of this same group indicated it did not receive adequate instruction during the first year of zero-base budgeting. This group may not have received training and consequently found it necessary to spend more time and effort in budget preparation or it may have been experiencing the tension of a new job assignment and therefore projected feelings of anxiety and inadequacy. Regardless, Question 14 shows this very same group felt it had adequate cost data with which to prepare its budget requests by a significant margin, 81.8 percent, compared to 41.7 percent for the respondents

who participated in the original implementation of zero-base budgeting. It may be that the non-participating group is unable to distinguish the adequacy of cost data or the cost data may, in fact have been adequate. Question 19 reveals that 54.6 percent of the non-participating group felt it was in the best interest of the Center to continue zero-base budgeting, either as it presently operates, or with major modifications, yet only 20.0 percent of those who participated in the original implementation felt that strongly toward the new system. Both groups had a nearly equal percentage of respondents who recommended discontinuing the zero-base budgeting system.

E. COMMENTS ON RESPONSES TO UNSTRUCTURED QUESTIONS (TABLE IV)

The list of summarized comments for Question 4 satisfies the expectations developed prior to the survey. The general dissatisfaction of the respondents with the zero-base process at the time of the survey, by virtue of the steepness of the first-year learning curve and the inability to see benefits immediately following the expenditure of a great deal of time and effort, is typified by Comments 5, 6, 8, 9, 23, 31, 34, and 36 in the response summary to Question 4. The expectation that some of the dissatisfaction would be attributed to inadequate implementation planning and guidance by top management and the budget staff is supported by Comments 3, 4, 5, 6, 7, 11, 14, 16, 18, and 29. The expected problem of paperwork volume was noted six times, as indicated

in Comment Number 1, making it the single most noted problem. The expectation that some managers and budget staff would believe zero-base budgeting was merely an exercise in paperwork designed to satisfy top management is supported by Comments 7, 11, 12, 13, 14, 18, and 29.

The expectation that some managers would report increased awareness of and control over the functions for which they were responsible is supported by Comments 1 through 9 of the response summary for Question 5.

F. ADDITIONAL COMMENTS (TABLES V and VI)

The information in Table V was used to support the analysis in Section B, above. The information in Table VI is a summary of what the author considered to be the most thoughtful comments made by respondents on the General Comments sheet attached to the questionnaire. The reader is referred to those tables for further review.

X. CONCLUSIONS

A. INTRODUCTION

This section presents the conclusions reached as a result of the analysis performed on the data obtained during the survey. First, conclusions about the theoretical problems of implementation which were adduced in this study to support its main thesis are presented. Second, the conclusions about the overall implementation of zero-base budgeting at Naval Weapons Center, China Lake will be presented. Third, the conclusions reached about the expectations which the study suggested as a result of the theoretical literature survey and the information obtained during the initial period of the investigation will be presented. Finally, some general conclusions will be presented.

While the author believes that, based on the survey and on observations during seminars, the conclusions are correct and represent a valid characterization of status of zero-base budgeting at Naval Weapons Center, China Lake, the reader is cautioned that the sample was limited to 25 written responses to the survey and that all formal documentation is based upon this limited sample.

It should again be noted that the implementation of zero-base budgeting at Naval Weapons Center, China Lake began at a time when relatively little information about the subject was generally available. In this

regard, the decision to install zero-base budgeting and the efforts made by everyone at the Center to support it must be considered innovative and forward-looking actions under conditions of great uncertainty. The reader is asked to bear in mind this fact when reading the following conclusions.

B. CONCLUSIONS ABOUT THEORETICAL PROBLEMS

1. Information

This study did not investigate all of the problem areas described by theoretical literature as outlined in Section V. Significant portions of the Decision Package Formulation and the Ranking Process problem categories were not addressed.

2. Conclusions

- Of the theoretical problem areas considered in the conduct of this study, Naval Weapons Center, China Lake did not experience any problems which had not been described somewhere in the theoretical literature.

- The problems experienced by the Center were adequately described in the theoretical literature.

- The theoretical problem categories which predominated this study were Administrative, Planning Assumption, Top Management, Time, and Behavioral.

- The Administrative problems most prevalent were: (1) paper-work volume; (2) process design structure (i.e., problems with

workplan, timetable, training, communication); and (3) process design function (i. e., doubts, conflicts, and motivation problems due to unclear goals and objectives).

- The Planning Assumption problems noted most often were:

(1) a wasting of time and resources due to revisions in planning assumptions and (2) inadequate coordination/cooperation due to the lack of a formal method of communicating and revising planning assumptions.

- The Top Management problems most apparent were: (1) insufficient involvement in the implementation process which gave rise to doubts and fears in lower level management and staff (that positive involvement by a significant portion of top management perceptible to the rank and file was not apparent) and (2) unrealistic expectations (initial emphasis on the cost-cutting feature of zero-base budgeting and moving too fast in implementation, i. e., implementation during the Mid-Year Review).

- The Time problems having the greatest impact were: (1) the large increase in the number of managers, particularly first-line supervisors, involved in the budget formulation process and (2) the steep learning curve (i. e., the Center training program designed to acquaint management and staff with the basics of zero-base budgeting) peculiar to the first year of implementation.

- The Behavioral problems noted most often were: (1) the beliefs that, (a) zero-base budgeting was not a very different budgeting system

from the previous one (i.e., the base-line/increment-line concept), and (b) zero-base budgeting would not provide enough benefits to make it worth its costs; and (2) gamesmanship tactics (i.e., including low priority functions in the minimum level of effort decision package).

3. Opinion

It is the opinion of the author that more attention to and understanding of the theoretical problems of implementation, particularly on the part of top management, would have prevented or greatly reduced a number of actual problems experienced by the Center in implementing zero-base budgeting.

C. CONCLUSIONS ABOUT IMPLEMENTATION OF ZERO-BASE BUDGETING AT NAVAL WEAPONS CENTER, CHINA LAKE

1. Information

The conclusions which follow resulted from analysis of the information contained in the survey questionnaire.

2. Conclusions

- The earliest efforts by top management to implement zero-base budgeting, the cost-reduction campaigns conducted during 1976 on the magnetic card typewriters and the computers throughout the installation, unintentionally predisposed a significant portion of the management and staff population against zero-base budgeting.

- This predisposition, caused by the cost-reduction campaign affected negatively the later, full-scale implementation of zero-base budgeting.



- It appeared that for the full-scale implementation of zero-base budgeting management generally used correct theoretical procedures.

- During the full-scale implementation of zero-base budgeting, attempts to compensate for the aforementioned predisposition required additional time and effort, particularly by upper-level managers, i. e., budget call by committee.

- At the time of this study, Naval Weapons Center was experiencing the expected, normal first-year problems attendant to the implementation of a zero-base budgeting system. As an organization undergoing a major change, the Center was "at the top of the cost curve" and "at the bottom of the benefit curve" as it completed its first year of work with zero-base budgeting. The "learning curve" was steepest during that period of time. A great deal of work had been done but few benefits had been recognized.

- There was both widespread dissatisfaction with, and a strong base of support for, zero-base budgeting in the organization at the time of the survey.

- It could not be determined what portion of the dissatisfaction was caused directly by problems with implementation procedures.

- A significant majority of budget staff and managers appeared to believe that the Office of Finance and Management did not conduct adequate advance planning before the implementation of zero-base budgeting.



- There was some uncertainty among budget staff and managers about the value of zero-base budgeting as an improvement over the previous budget system.

- There was substantial doubt among managers and budget staff whether the benefits of zero-base budgeting would be worth the effort.

- The training efforts conducted or initiated by the Center had a positive effect on the knowledge level of managers and budget staff as applied to decision package formulation.

- There was a significant increase in management involvement in the budget formulation process, particularly among first-line supervisors.

- The increased involvement of managers in the budget formulation process led to greater awareness of, and control over, their functional areas of responsibility.

- Where it was perceived, the absence of first-line supervisory involvement had a negative effect on the view of budget staff and managers toward continuing the zero-base system at Naval Weapons Center.

- Some shifting of resources occurred within departments as a result of zero-base budgeting.

- There was no correlation between the acceptance or rejection of zero-base budgeting and reallocation of resources.



- Zero-base budgeting, as practiced at the Center at the time of this study, took more time and effort than the previous budgeting system.

- Cost data for use in decision package formulation were, in some cases, difficult to obtain.

D. CONCLUSIONS ABOUT EXPECTATIONS

1. Information

The five expectations, described in the Conduct of Research section, which were developed as a result of the literature survey and information gathered during the training seminars on zero-base budgeting, were generally substantiated by the data obtained from the survey questionnaire.

2. Conclusions

- The expected dissatisfaction among staff and management with the implementation effort was generally substantiated by the comments, made in response to Question 4 of the survey, which are displayed in Table IV. The distribution of responses to Questions 3 and 19, displayed in Table I, likewise support this expectation.

- The expectation that dissatisfaction with implementation planning and guidance on the part of top management and the budget staff would be expressed was generally supported by Comments 7 and 8 in Table VI and specifically by the response distributions of Questions 10, 11, and 12 as shown in Table I.



- The expectation that volume of paperwork would be considered a major problem was generally supported by Comment 1 for Question 4 in Table IV and by Comment 9 in Table VI.

- The expectation that some managers and budget staff would believe that zero-base budgeting was merely an exercise in paperwork designed to satisfy top management's desires to improve budgeting methods was generally substantiated by Comment 10 in Table VI and Comments 11, 20, and 29 to Question 4 in Table IV.

- The expectation that some managers would report increased awareness of and control over their functional areas of responsibility due to their involvement in the budget process was upheld generally by Comment 3 in Table VI and the response distributions for survey questions 8 and 9, displayed in Table I.

E. GENERAL CONCLUSIONS

- On the basis of this study, it could not be empirically concluded that correct implementation of zero-base budgeting, with respect to the theoretical writings, leads to expected satisfactory results.

- It was concluded that incorrect implementation procedures will lead to expected problems.

- Naval Weapons Center, China Lake has expended a large amount of time, effort, and other resources to implement a zero-base budgeting system. The problems attendant to that implementation were neither unusual to the body of knowledge about zero-base budgeting nor unique to the organization implementing the system.



XI. RECOMMENDATIONS

A. INTRODUCTION

This section first presents summary comments followed by three recommendations for Naval Weapons Center, China Lake regarding zero-base budgeting. It then presents two recommendations for avoiding many of the problems attendant to the implementation of a zero-base budgeting system.

B. SUMMARY COMMENTS

In his book, Zero-Base Budgeting Comes of Age, Logan Cheek discusses the essential value of the zero-base budgeting technique. He first points out that experience suggests that many planning and budgeting executives have difficulty using the system and achieving the bottom-line benefits claimed for it. He points out two reasons why this is true:

Usually, what's lacking is either an in-depth appreciation of zero-base budgeting techniques, or more commonly, the art of handling the behavioral subtleties of the organization. If management fails on either of those counts, zero-base budgeting may generate more heat than light.¹⁵

Cheek also notes that existing management literature does not adequately cover the two crucial aspects of zero-base budgeting - what it is and what it takes to make it work. He goes on to point out that the

¹⁵Cheek, p. 165.



objective of zero-base budgeting is to compare alternate uses of scarce resources and that, if zero-base budgeting is to be of practical use, it must be considered in view of the broad, long-range needs of the organization as expressed in its goals, strategies, and objectives.

Understanding all of the ramifications of zero-base budgeting can be a discouraging endeavor because effective use of the system requires the incorporation of time-tested principles from many management disciplines. Among these principles are problem solving, systems analysis, cost/benefit analysis, management by objectives, and careful attention to the age-old skills of persuasion. Cheek states clearly the basic dilemma faced by the executive implementing zero-base budgeting:

These demanding aspects of zero-base budgeting inject a sobering element into our high aspirations for it. Considering the broad skills required to implement the process successfully, it may well seem amusing that budget staffs go through elaborate gymnastics to install zero-base budgeting procedures. On the one hand, if we fail to pay attention to these management basics, we risk failure by oversimplification; on the other hand, with proper attention to the basics we may well create an unmanageable leviathan.¹⁶

An objective look at the resource allocation decision-making process suggests that zero-base budgeting has proved its worth as a technique for decision-making and that this dilemma need not prevent its successful implementation. Ultimately, all management decisions are made by people with different personalities, backgrounds, sets of

¹⁶Cheek, p. 167.



relationships and with differing abilities to innovate, analyze, and synthesize. Rarely are bold innovations made quickly, but rather they result from careful and lengthy study and discussion. Often, several alternatives are pursued simultaneously until economics or some other imperative forces a decision. And regardless of the objectivity and thorough analysis contained in a series of decision packages, a final "yes/no" decision often requires several meetings of committees, working groups, or task forces, each shrouded in political intrigue, often riddled with attacks and counterattacks by different interest groups. It is here, in this arduous, complex, potentially destructive process leading to a major decision, that zero-base budgeting has emerged as a valuable aid to informed judgement. There are several reasons for this.

First, zero-base budgeting is a disciplined technique for organizing and displaying the possible alternative decisions, analyzing the costs, benefits, and risks of each, thus revealing their broad impact on the total organization rather than just one functional part of it.

Second, in addition to sharpening the insights of individual managers, both the format of decision packages and the proper use of persuasion skills disciplines the collective discussions during ranking meetings. Initially, each player may well champion a particular set of packages, using his intellect, training, and personal aims to advocate the interests he represents. Arguments follow, often ignoring factual



evidence. But zero-base budgeting in its broadest sense refocuses the discussion away from irrelevant political disputes by imposing its logical fact-based framework which helps distinguish fair criticisms from phony arguments.

Third, that disciplined framework provides a complete and simple technique for the members of the management team to use in order to grasp the essence of a problem, identify and evaluate alternative solutions, and select an appropriate and affordable level of effort.

Pointing out the the true value of zero-base budgeting, Cheek notes:

This is where the essential importance of zero-base budgeting lies and why rigorous exposition of alternative ways and levels of achieving the same objective is necessary. If only the costs of a given approach were important, then traditional budgeting techniques (or more probably, simple cost/benefit analysis) would suffice to group the packages' economic implications. The characteristic strength of zero-base budgeting derives from its subtler aspect: the analytic discipline it requires from its users, who must assess the assumptions of each package, how it ties to the organization's objectives and strategies, and what its legal, technical, and operational ramifications are. This characteristic of zero-base budgeting, substantially missing from other techniques, makes it the exciting valued new management tool it is, and has made it come of age.¹⁷

The preceding comments were intended to give the reader an accurate glimpse into the heart of the zero-base budgeting philosophy. For those still confounded by its apparent complexity, it need only be as cumbersome as its users make it. For those timid before the challenge of

¹⁷Cheek, p. 168.



zero-base budgeting, a final thought: It is hard work to make difficult decisions under uncertain conditions, but that's what good managers are paid to do.

C. RECOMMENDATIONS FOR NAVAL WEAPONS CENTER, CHINA LAKE REGARDING ZERO-BASE BUDGETING

- It is recommended that Naval Weapons Center, China Lake continue the full-scale implementation of a zero-base budgeting system in all departments, both Technical and Support.

- It is recommended, consistent with the views of the zero-base budgeting theorists, that a thorough reevaluation of the zero-base budgeting implementation program be conducted.

- It is recommended that emphasis on the increased participation of top management in the program of implementation, and eventually the normal budget formulation process, of zero-base budgeting be intensified.

D. GENERAL RECOMMENDATIONS FOR AVOIDING MANY PROBLEMS ASSOCIATED WITH THE IMPLEMENTATION OF A ZERO-BASE BUDGETING SYSTEM

1. Develop a Zero-Base Budgeting Manual Tailored for Use with the Particular Organization

In order to implement a zero-base budgeting system successfully, a most important first step should include the preparation and distribution of a locally designed manual. Both Pyhrr and Cheek stress this point and provide sample manuals in their work. For detailed study, the reader



is referred to those sources. Briefly, however, such a manual would include the following subjects: (1) a letter of introduction; (2) the purpose, philosophy, concepts, and objectives of zero-base budgeting; (3) the strategic outlook for the organization; (4) instructions for decision packages; (5) instructions for the ranking process; (6) a calendar of events; and (7) corporate standard guidelines and planning assumptions. Each of these subjects will be very briefly discussed below.

The chief executive's full and explicit support is essential if the zero-base budgeting process is to be implemented successfully. The manual should therefore start with a letter of introduction from the chief executive ... expressing his firm personal commitment to and intent to be involved in the zero-base budgeting effort.¹⁸ Including a statement that budgets will be determined through the zero-base budgeting process lends necessary backing and weight to the importance of the effort.

The purpose, philosophy, concepts, and objectives section describes briefly zero-base budgeting and sells its benefits. It should point out that the process shifts the burden of proof to each manager to justify why he should spend any money. It should explain what zero-base budgeting will do for each manager and should tell the advantages of using a zero-base system. It should explain the concept of a decision unit as being a discrete function, operation, item, or organizational

¹⁸Cheek, p. 172.



unit and should explain the concept of a decision package as a document which contains analysis of decision units with respect to the two alternatives of different ways of performing the same function and different levels of effort of performing the function. The ranking process should also be explained and the time reducing technique of focusing on the packages which are ranked just above and just below the expected funding line should be discussed. The line of connection between the long-range planning cycle; the organizational goals, objectives and strategies; the decision units which analyze the discrete functions, operations, or activities which support those goals, objectives, and strategies; and the decision packages which contain the analysis of the decision units should be drawn clearly and described succinctly. It should be explained that zero-base budgeting is a decision-making technique and one of its end products happens to be a budget. Its primary purpose is to help determine what is going to be accomplished, how its going to be done (or done better), and why its being done. The issue of how much it will cost will be resolved in a simple, mechanical, unemotional way.

The purpose of the strategic outlook section is to relate the proposed zero-budgeting system to the organization's long-range plans. Information about such plans is normally classified and should be discussed only on a "need to know" basis. The natural order of presentation for the body of this section would be to start with a broad assessment of the organization's environment, translate this evaluation into long-range objectives to be pursued by the organization, and finally discuss



the specific strategies for achieving them.

The section containing instructions for and examples of decision packages explains the four steps in the decision package formulation process: (1) Define objectives for each function within a given manager's area of responsibility; (2) Describe alternative ways of obtaining each objective; (3) Choose the best alternative by considering (a) legal requirements, (b) immediate payback, (c) technical feasibility, (d) operational feasibility, (e) economic feasibility, and (f) the risks of not acting; and (4) Describe the different levels of effort (with the constraint that the sum of, at least, the first two increments proposed should equal this year's spending level).

Management may decide to issue separately instructions for the ranking process only to those who will do the ranking. Having this section included in the manual, however, allows everyone to understand quite specifically how the entire process will work and diffuses any uncomfortable feelings of being threatened among the rank-and-file managers. The variety of ranking procedures available is such that a discussion of them is considered infeasible in this study; however, three questions should be answered by whatever process is employed:

- Which of the proposed decision packages best support the organization's goals, as established in the long-range planning cycle?
- How much will be spent in pursuing these goals?



- For the packages not approved, what are the consequences of not implementing them? How can those problems be anticipated and how can they be managed?

To ensure timely completion of the budgeting process, the manual should incorporate a detailed schedule of events for the zero-base budgeting effort. This timetable should be developed using realistic estimates of the time required to perform specific tasks and it should include sufficiently detailed instructions for managers and staff to understand what is expected of them.

In a zero-base budgeting system, where many, many rank-and-file managers will be involved, most for the first time, in the planning process, a common set of ground rules for standard cost factors, planning assumptions, and expenditure guidelines is particularly critical. Unless all use the same values for such things as revenue growth, labor rates, or productivity improvements, the ranking and decision-making process will become hopelessly confused. The factors and assumptions will, obviously, be unique for any organization undertaking zero-base budgeting and will have to be updated for every new budgeting cycle. They should be detailed enough to permit developing intelligent, reasonably accurate decision packages, but not so overly complicated as to invite the "paralysis through analysis" syndrome. A statement instructing managers to use the assumptions when putting together zero-base budgeting decision packages should accompany the data.

2. Use These Guidelines to Avoid Implementation Problems

Cheek provides several general guidelines to eschew many of the problems common to the implementation process.¹⁹ It is highly recommended that these guidelines be considered carefully and followed closely, not only in preparing the locally designed implementation manual, but also subsequently as actual implementation is in progress. Briefly, Cheek's guidelines require:

- Obtain the endorsement, cooperation, and participation of senior management.
- Set your goals - both for your organization and the zero-base budgeting process - and get to them.
- Before starting, review your organization.
- Obtain adequate staff to start up the zero-base budgeting process.
- Set up contacts throughout the organization.
- Establish clear review procedures for the decision packages.
- Get off to a good start.
- Reevaluate the program after a trial period.
- Beware of self-appointed experts.
- Expect to spend a lot of time.
- Beware of shortcuts. Zero-base budgeting is not easy. You get what you pay for.
- Maintain your local contacts.

¹⁹Cheek, p. 163.



- Follow up with feedback to all participants on what happened to their decision packages or ideas.
- Do not expect immediate Return on Investment.
- Do not expect miracles.
- If you're the controller of manager in charge of the zero-base budgeting process in your organization, keep your cool. As Robert Townsend says, the controller "must never lose his head - that's what managements do, not controllers ... There abideth accuracy, timeliness, understanding, and unflappability in the controller's office - and the greatest of these is all four of them."²⁰
- Everyone involved in the process, whether they're developing decision packages, reviewing them, or ranking them, and even those developing the basic procedures and forms, should challenge anything connected with the zero-base budgeting process with these three questions: "So what?" "What else?" and "Why?"
- Remember that zero-base budgeting is a means to an end, not an end in itself. It is very easy to become trapped in analyzing all the information that zero-base budgeting will invariably produce. While much of the analysis will be provocative and will indeed in many cases lead to innovative ideas for improving operations, the information contained in the decision packages is above all a means to make decisions on better resource allocation.

²⁰Townsend, Robert, Up the Organization, p. 76, Alfred A. Knoph, 1970.



COVER MEMORANDUM



DEPARTMENT OF THE NAVY
 NAVAL WEAPONS CENTER
 CHINA LAKE, CALIFORNIA 93555

IN REPLY REFER TO:

0831/BB:jn

Reg 08-2212-77

9 September 1977

MEMORANDUM

From: Head, Budget Division (Code 083)

To: Distribution

Subj: Evaluation Study of the NWC Zero-Base Budget System

Encl: (1) General Instructions for ZBB Questionnaire

(2) Questionnaire: Zero-Base Budgeting

1. A study is being conducted to evaluate the zero-base budget system at NWC, China Lake and your help is needed. The opinions of budget analysts and fiscal officers such as yourself are critical to the study and would be appreciated. It is understood that not all the questions will be appropriate to all cases. You are requested to provide responses to the best of your ability.
2. Enclosure (1) is a general instruction sheet to assist you in filling out the questionnaire. Enclosure (2) is a questionnaire seeking your opinions on various aspects of the zero-base budget system. The information contained in the completed questionnaire will be held in strictest confidence. Only summary information will appear in the published results of the study. Please do not identify yourself or your department in the questionnaire.
3. A return envelope is provided for your convenience. Thank you for your time and effort.

A handwritten signature in cursive script, reading "Brenda Larnett", followed by a small flourish.

GALE POPPEN

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APPENDIX B

General Instructions for ZBB Questionnaire

There are five general questions on the first two pages of the questionnaire. Please answer them before completing the remaining questions and please do not change your answers to questions 1 thru 5 after answering questions 6 thru 19.

The first question asks you to categorize your department based on the total amount of overhead funds received in 1977 (FY). This is needed to identify the problems peculiar to the various levels of organization during the zero-base budgeting process. The second general question is concerned with whether you were the budget analyst/fiscal officer of your present department when zero-base budgeting was first implemented. If your answer to this is "no," please complete the questionnaire as you feel it would have been done in your present department. The third question asks for your basic general impression of the zero-base budgeting system now being used at NWC. The fourth and fifth questions seek to identify the major problems and benefits resulting from the implementation of zero-base budgeting at NWC. The study is primarily interested in identifying those problems you have actually experienced and those benefits you can readily identify. If you know about other major problems or have heard about other benefits, list them also. Naturally, the more information you can provide, the better,



but considering your time constraints, a brief description of the problems and benefits you do list would be appreciated. Also note that space has been provided below selected questions and at the end of the questionnaire for any comments you wish to make.



APPENDIX C

QUESTIONNAIRE: ZERO-BASE BUDGETING

1. Size of department based on FY-77 allocation of funds for indirect expenses (for Support departments, use approved G&A dollar cost level; for Technical departments, use approved cost center indirect expense level).

___ > \$4,000,000
___ > \$2,000,000
___ > \$1,000,000
___ < \$1,000,000

2. Were you "budget analyst" of your department during the original implementation of ZBB?

___ Yes.
___ No.

3. In your opinion, is ZBB an improvement over the previous budget system used at NWC?

___ Yes.
___ No.
___ Uncertain.



4. List the major problems you have experienced or know about resulting from the implementation of ZBB at NWC, China Lake.

Briefly describe each. (Use back if necessary)

5. List the major benefits you have experienced or know about resulting from the implementation of ZBB at NWC, China Lake.

Briefly describe each. (Use back if necessary)



6. What effect did the zero-base budget system have on the time and effort in budget preparation during the first year of its implementation?

- ☐ Increased considerably.
- ☐ Increased slightly
- ☐ Remained about the same.
- ☐ Decreased slightly.
- ☐ Decreased considerably.

7. Now that the ZBB system has been implemented, how great is the time and effort spent in budget preparation in comparison to the previous budget system?

- ☐ Much greater.
- ☐ Slightly more.
- ☐ About the same.
- ☐ Slightly less.
- ☐ Much less.

8. Did the department head become more involved in budget formulation after the implementation of ZBB?

- ☐ Much more involved.
- ☐ Slightly more involved.
- ☐ About the same.
- ☐ Slightly less involved.
- ☐ Much less involved.

9. Did the first-line supervisors become more involved in budget formulation after the implementation of ZBB?

- ☐ Much more involved.
- ☐ Slightly more involved.
- ☐ About the same as before.
- ☐ Much less involved.

10. Do you feel adequate advance planning on the part of Department 08 was conducted before implementation of the new ZBB system?

- ☐ Yes.
- ☐ No.
- ☐ Uncertain.

Comment:



11. Do you feel you received adequate instructions during the first year of ZBB to properly prepare your budget requests?

___ Yes.
___ No.
___ Uncertain.

12. Do you feel you presently have adequate instructions as to how to properly prepare a zero-base budget?

___ Yes.
___ No.
___ Uncertain.

13. During the first year of operating with the zero-base budget system, did you have adequate cost data available to properly prepare decision packages?

___ Yes.
___ No.
___ Uncertain.

14. Do you feel you presently have adequate cost data necessary to properly prepare a decision package?

___ Yes.
___ No.
___ Uncertain.
Comment:

15. Did implementation of the ZBB system cause a shifting of financial resources among functions in your department?

___ Large shifting of financial resources.
___ Some shifting of financial resources.
___ No apparent shifting of financial resources.
___ Uncertain.
Comment:



16. All good management systems generate information for management planning and control. What effect did the zero-base budgeting system have on the quality of management information as compared to the previous budgeting system?

- ☐ Quality of management information substantially improved.
- ☐ Quality of management information slightly improved.
- ☐ About the same as before.
- ☐ Quality of management information slightly decreased.
- ☐ Quality of management information substantially decreased.

Comment:

17. After your department has submitted its decision package rankings for executive review, are you notified of any changes in these rankings and the reasons for the change?

- ☐ Always.
- ☐ Most of the time.
- ☐ Seldom.
- ☐ Never.

18. Presently, you are required to prepare decision packages representing different levels of effort for each function. Do you feel it is practical to prepare a decision package representing a minimum level of effort?

- ☐ Yes.
- ☐ No.
- ☐ No opinion.

19. This study is very interested in your opinion of the zero-base budgeting system. Which of the following choices do you feel is in the best interest of NWC, China Lake?

- ☐ Continue the ZBB system substantially as it operates today.
- ☐ Continue the ZBB system with some major modifications.
- ☐ Continue the ZBB system except that it not be employed every year.
- ☐ Discontinue the ZBB system.

Comment:



-- GENERAL COMMENTS --



LIST OF REFERENCES

1. Pyhrr, Peter A., "Zero-Base Budgeting," Harvard Business Review, v. 48, p. 111-121, November/December 1970.
2. Pyhrr, Peter A., Zero-Base Budgeting, p. 1-130, Wiley, 1973.
3. Minmier, George Samuel, An Evaluation of Zero-Base Budgeting as a tool for Planning and Control of Discretionary Costs in Governmental Institutions, Ph.D. Thesis, University of Arkansas, 1974.
4. Cheek, Logan M., Zero-Base Budgeting Comes of Age, p. 22-24, 31-107, 146-191, AMACOM, 1977.
5. Stonich, Paul J., Zero-Base Planning and Budgeting, p. 2-9, 19-32, DOW JONES-IRWIN, 1977.
6. Taylor, Graeme M., "Introduction to Zero-Base Budgeting," The Bureaucrat, v. 6, p. 36-41, Spring 1977.
7. Naval Weapons Center, China Lake, unpublished information Brief, 30 September 1976.



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